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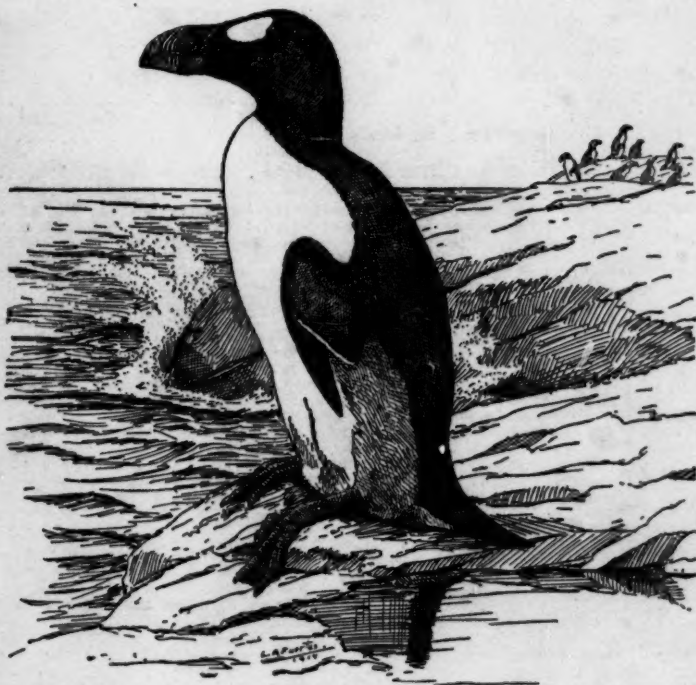
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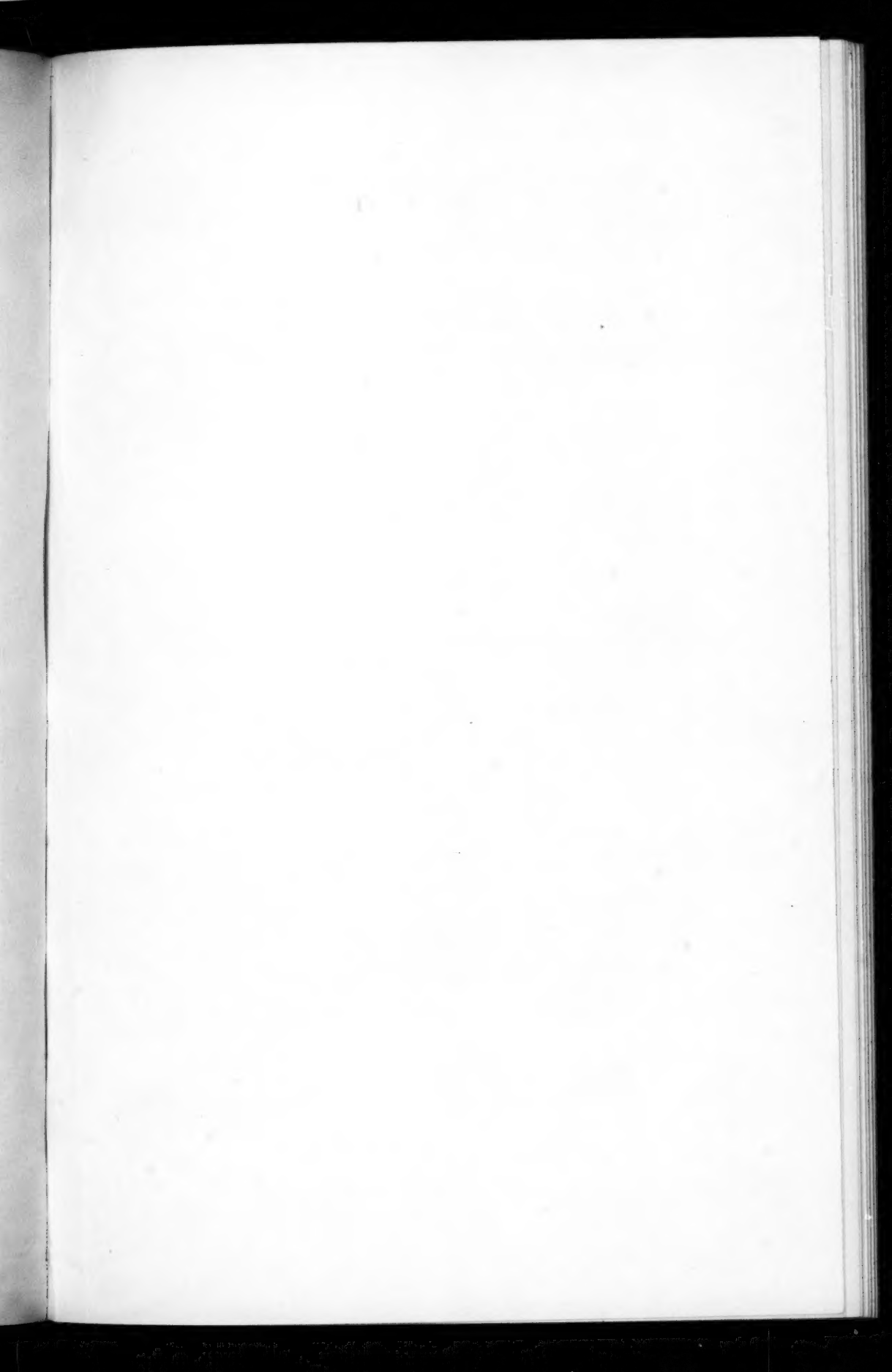
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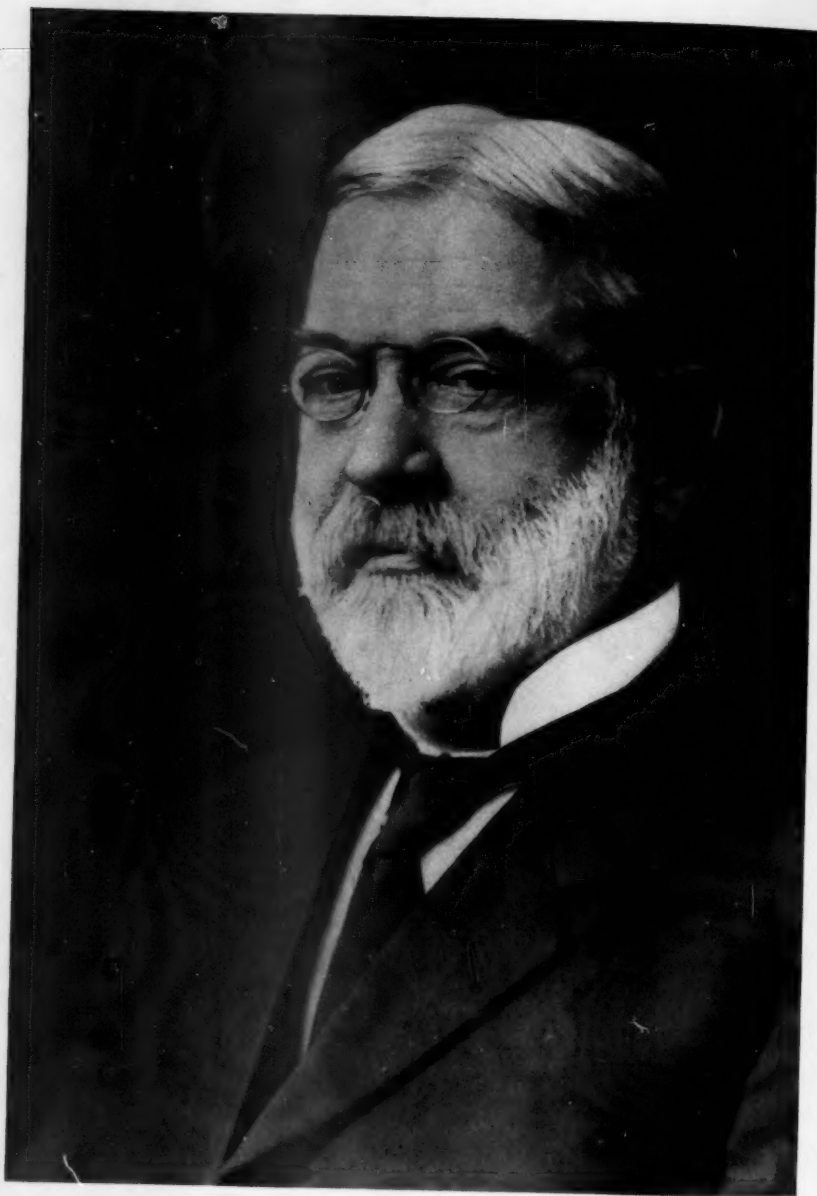
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Wm. Dutcher.

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IN MEMORIAM: WILLIAM DUTCHER.

BORN JANUARY 20, 1846—DIED JULY 1, 1920.

Plate XV

BY T. S. PALMER.

STANDING in the heart of the business district of lower New York, within a stone's throw of Wall Street and old Trinity Church, is a building of a dozen or more stories, formerly considered a tall structure but now overshadowed and almost shut in by neighboring skyscrapers. To the casual observer there is little to distinguish this building, at 141 Broadway, from others in the neighborhood and it seems a most unlikely place for effective work in ornithology, but to one familiar with the circumstances the spot recalls associations and events of far reaching interest and importance. Here on one of the upper floors overlooking Broadway was the private office of William Dutcher, Ornithologist, Bird Lover and Conservationist. This was the scene of his labors during the years of his greatest activity and here he set in motion various projects which made a profound impression on the protection of bird life in distant parts of the country and resulted in the erection of an imperishable monument to his name.

William Dutcher was the son of Rev. Jacob Conklin Dutcher,

a Dutch Reformed minister, and Margaretta Ayres, of New Brunswick, N. J. On his father's side he was a direct descendant of Captain William Dutcher of revolutionary fame, and of Isaac Van Wart, one of the captors of Major André; and on his mother's side, of Edward Fuller, one of the Mayflower pilgrims. He was born at Stelton, N. J., January 20, 1846, while his father was still a theological student at Rutgers College. After a few months his father moved to Coxsackie, N. Y., where he had a parish and about two years later again moved to Owasco, southeast of Auburn, N. Y. William's early education was secured in the local schools, but at the age of thirteen circumstances having made it necessary for him to engage in some occupation, he entered the office of a banker named Wright at 13 Bond Street, New York City, and while there employed lived with Mr. Wright and became a member of his family. A few years later, when his health was threatened, through the confinement of the office, he worked for some time on a farm near Springfield, Massachusetts.

Dutcher's career may be conveniently divided into decades. The first and second included his boyhood and early experience in business life, the third marked his entry into the insurance business in New York, and the following three decades from 1879 to 1910 were the years of his ornithological activity while the last decade of his life was passed in retirement.

Returning to New York City about the age of twenty he became connected with the Brooklyn Life Insurance Company and entered on a business career in life insurance which was destined to continue for many years. Entering the office first as clerk he was later promoted to the position of cashier and finally secretary. He remained with this company until the winter of 1894-95, when he became associated with the Prudential Insurance Company of New Jersey, with which he remained until his retirement from active business.

On May 18, 1870, at the age of twenty-four, Mr. Dutcher was married to Miss Catharine Oliver Price of Elizabeth, N. J., and took up his residence at Bergen Point, in that State. Here his son, Basil was born December 3, 1871. In 1876 he moved to New York, residing at 27 West 18th Street, afterwards occupied by the

store of Siegel-Cooper & Co., and five years later moved to 128th Street. In the spring of 1889 he moved again, this time to 525 Manhattan Avenue, a number well-known to all the early members of the Union, as it was here that the Treasurer had his office and the council usually held its meetings when the Union met in New York.

While living in New York, Mr. Dutcher was accustomed to find his recreation in hunting, chiefly along the shores of Long Island and New Jersey, where during the open seasons his holidays were spent in search of game birds—snipe and ducks in the autumn, and geese in March. On May 28, 1879, while hunting on the shores of Shinnecock Bay near Good Ground, Long Island, he shot a bird which was new to him and which proved to be a female Wilson's Plover (*Ochthodromus wilsonius*). This bird, mounted by John Bell, the veteran taxidermist of New York, became number one in the Dutcher collection of Long Island birds and was duly recorded in a brief note in the October number of the 'Bulletin of the Nuttall Ornithological Club' for 1879. The seemingly unimportant incident of the capture of this specimen and the publication of this brief note marked the turning point in Dutcher's career and proved the opening of a new chapter in his life. From this time on his interest in birds developed along new lines and he hunted not merely for recreation and amusement but to add to his knowledge of bird life and to acquire information which would aid in the prosecution of his scientific studies.

Finding that his time was limited he resolved to confine his attention to the birds of Long Island and soon became deeply interested in collecting all available information regarding the species of this region. His collection grew apace and was increased by the addition of specimens from various sources. At the same time he carefully and systematically collected every record and bit of information which would throw light on the precise distribution, occurrence and habits of Long Island birds. For about fifteen years he devoted unremitting attention to accumulating material both in the form of specimens and notes which would be useful in the preparation of a comprehensive work on the birds of Long Island. He examined the specimens

in the collection of the Brooklyn Institute, and the American Museum, and in various local collections. He secured notes and records from sportsmen, market hunters, and baymen, and in short left no stone unturned in bringing together facts of interest regarding the various species.

Shortly after the organization of the Linnaean Society of New York he became a member and met George N. Lawrence, the veteran ornithologist, and others who were active at that time. Upon the founding of the American Ornithologists' Union in September, 1883, Dutcher was elected an associate member and in the following year was appointed on the committee on Protection of North American Birds. The active work of this committee really began at a meeting held in his office at 51 Liberty Street, New York City, in December, 1885. The chairman of the committee was the late George B. Sennett and among the most active members were Dr. George Bird Grinnell, then editor of 'Forest and Stream,' and William Dutcher. The original minutes of the meetings of this committee, entered in a book which is now in the possession of the National Association of Audubon Societies, show in detail the work accomplished during the three years that the committee was active. The most important results included the organization of the original Audubon Society with a large membership and the drafting of a model law, for the protection of non-game birds subsequently known as the A. O. U. or Audubon law.

In 1886, at the first Washington meeting of the Union, Mr. Dutcher was elected an active member and this event marked the beginning of his association with certain activities at the National Capital. It was here at a subsequent meeting of the Union that he exhibited with considerable pride the results of his first experiments in photographing birds. It was here that he later paved the way for the inclusion of nongame species in the Federal law for the protection of migratory birds and it was here finally that he took up his last residence shortly before his death.

In 1887 he was elected Treasurer of the Union, an office for which he was peculiarly well adapted and which he filled with

remarkable success for a period of sixteen years. Singularly systematic in all his work and prompt in business dealings, he had little patience with failure to act promptly in business matters. So successful was he in collecting dues that a year or two after his appointment he was able to report at the annual meeting that 90 per cent. of the entire membership was fully paid up to date, a record which has perhaps not since been surpassed.

During the early nineties, about the time of Dr. Parkhurst's activities and the investigation of the Lexow Committee, Mr. Dutcher became active in civic affairs. Deeply interested in the movement for the improvement of conditions in New York City, he became identified with good government clubs, took an active part in elections, served on several occasions as inspector or judge of elections, and became thoroughly familiar with the records of various candidates for local offices. On one occasion he was urged to become a candidate for alderman but for various reasons declined to enter the race. His experience in civic affairs laid the foundation for much of his subsequent work and made a deeper impression on his later activities than was apparent at first sight. Under the head of what he was accustomed to call "civics" Mr. Dutcher included certain public activities which he considered a part of the personal and public duties of every good citizen and which he took as seriously as he did his business or any other matters in which he was particularly interested. During all his active career he never failed to familiarize himself with the records and characteristics of the principal local and state candidates for office, and to a certain extent of those in the field of national politics. Doubtless the experience gained at this time enabled him in later years so successfully and effectively to handle legislative matters when he took up practical work in behalf of bird protection.

In 1896 and in 1897 he served as chairman of the committee on Protection of Birds of the American Ornithologists' Union and was especially active in urging the formation of State Audubon societies. These years of preliminary preparation proved to be merely an introduction to his most important life-work.

The opening year of the new century marked the beginning of

the most active period in his career and of his work in bird protection. In December, 1899, Abbott H. Thayer, the artist, wrote to Dr. Stone, then chairman of the A. O. U. Committee, relative to raising a fund for the protection of the colonies of sea birds along the Atlantic Coast. Mr. Dutcher was induced to take charge of this phase of the Committee's work and at once entered into correspondence with Mr. Thayer. In a letter dated January 25, 1900, the latter inclosed \$110 as a contribution "toward our fund" and in the weeks which followed added substantial contributions. It happened that at this time Mr. Dutcher was particularly interested in a bill then pending in the New York legislature for the protection of gulls and terns, and he saw the possibilities in this fund for helping his work in the Legislature and in providing the payment of wardens to protect the gull colonies. By April work had progressed to a point where the fund warranted active field work, but operations were handicapped by lack of information as to actual location of the most important breeding grounds and the protection accorded the birds under State laws. Nevertheless wardens were employed and a beginning made in what proved to be the first practical work in America in protecting sea birds.

It should be recalled that at this time there was pending in Congress a measure of far reaching importance, commonly known as the Lacey Act. This bill which had been under consideration for nearly three years was finally passed by the House on April 18, 1900, three weeks later by the Senate, and on May 25, it became a law. During the closing weeks of this legislation Mr. Dutcher took an active part in assisting in the passage of the Act, notwithstanding his activities in organizing a warden force and in keeping in touch with legislation at Albany.

At the next annual meeting of the Union held in Cambridge, Mass., in the following November, he presented a detailed and very interesting report of the activities of his committee along the coast from Maine to Virginia. Experience had shown that the work was hampered by lack of adequate laws by which the birds could be given protection even when under the care of regular wardens. With the beginning of 1901, a year in which the

legislatures of most of the States were in session, Mr. Dutcher laid out an elaborate campaign for better bird legislation. The latter part of January found him at Augusta, Maine, urging in person before a joint committee of the House and Senate the necessity for proper protection of gulls and terns on the Maine coast. Later at Trenton, N. J., Albany, N. Y., and Hartford, Conn., he had bills introduced including the provisions identical with or closely modeled after the A. O. U. law. In Massachusetts through other members of the committee similar legislation was introduced, while in Delaware after a hot campaign he finally succeeded in securing the enactment of a comprehensive bird law. Later in the spring when the legislature of Florida convened he journeyed to Tallahassee and spent ten days in an effort to convince the members of the importance of bird protection. So successful was he in these various directions that at the close of the year he had the satisfaction of reporting that the model law had been enacted in seven of the States and for the first time it was possible to provide adequate protection for gulls and terns at the most important breeding colonies along the coast. Shortly after the enactment of the Florida statute attention was called to the important colony of Brown Pelicans which had nested for many years on Pelican Island in the Halifax River near Sebastian, Fla., and which on various occasions had been subjected to ruthless slaughter. Several times the nests had been robbed to such an extent that the future of the colony was threatened. It seemed desirable that title should be acquired, if possible, to the small island on which the birds nested, but as the island was still unsurveyed public land it could not be purchased until it had been surveyed and the plat approved by the General Land Office. Mr. Dutcher thereupon arranged to have the island surveyed but to his dismay learned that on approval of the survey the land would be open to entry by anyone and he might finally fail to secure possession. At this juncture a suggestion was made by the Surveyor General of the General Land Office that the island should be made a National Reservation by Executive Order. Mr. Dutcher at once adopted the suggestion with enthusiasm and upon his recommendation, made through the

United States Department of Agriculture, Pelican Island was reserved by President Roosevelt on March 14, 1903, as a preserve and breeding ground for native birds and thus became the first National Bird Reservation.

Two years previous the first steps toward the foundation of the National Association of Audubon Societies had been taken at the annual meeting of the Union in Cambridge in November, 1901, through the organization of a National Committee made up of representatives of the various State societies. Mr. Dutcher was elected chairman of this committee and the work began to grow apace. Among those who became interested in the new organization at an early date was Albert Wilcox, a cotton broker of New York and New Orleans, who after meeting Mr. Dutcher and looking into the plans for work urged the appointment of an active secretary who could devote considerable time to building up the membership and extending the influence of the association. He also suggested the incorporation of the association. Acting on these suggestions Mr. T. Gilbert Pearson was appointed secretary and in January, 1905, the new organization was incorporated as the National Association of Audubon Societies and Mr. Dutcher was elected president. The wisdom of the selection of these two officers was amply justified by the success of their work. In the following year Mr. Wilcox died suddenly and it was then discovered that he had endowed the Association handsomely, and having made it one of the residuary legatees under his will, the Association received an endowment of \$331,072. This bequest immediately assured the permanency of the Association and its work of education and conservation.

The year 1907 was a busy one both in legislation and in extension of the work of the Association, but a sad one for Mr. Dutcher on account of the impairment of the health of his daughter, Mary, who had contracted tuberculosis. In the hope that a change would benefit her health, he decided in 1908 to move from New York to Plainfield, N. J. This hope proved in vain and within a few months he was called upon to meet one of the greatest sorrows of his life in the death of his daughter on January 17, 1909. How much this loss meant to him and how much it affected

his career is known to but few outside the immediate family circle.

The year 1910 may fairly be considered as the culmination of Mt. Dutcher's career. The outstanding project of the spring was the introduction in the New York legislature of the Shea-White bill prohibiting the sale of aigrettes. Active work in behalf of the bill at Albany was entrusted to Mr. Pearson, while Mr. Dutcher remained at his office in New York skilfully directing affairs and bringing every pressure to bear in behalf of the measure. So successful were the efforts of the friends of the measure that the bill finally passed and was approved by Governor Hughes on May 7, thus for the first time providing adequate means of restricting the traffic in aigrettes for millinery purposes. No sooner was the success of the measure assured than Mr. Dutcher sailed for Europe as the representative of the National Association at the Fifth International Congress of Ornithology which convened in Berlin on May 30. Here he extended an invitation to the Congress to hold its next meeting in the United States, presented a paper on International Bird Protection, and received an appointment on the International Committee for the Protection of Birds. Upon his return to New York early in the summer he was welcomed by a number of his friends who had arranged a luncheon in his honor on July 14 and presented as a testimonial of their regard for his success in bird protection a fund of about \$7500 to be known as the Mary Dutcher Memorial Fund. Two months later, in September, occurred the annual meeting of the American Fisheries Society at the New York Aquarium which Mr. Dutcher attended and discussed with various members matters of conservation of mutual interest.

On October 19, only six days before the annual meeting of the National Association, which was to have been a notable event in celebration of the successful work of the year, Mr. Dutcher suffered a stroke of apoplexy which paralyzed his entire right side and left him speechless so that he was unable to communicate his thoughts except by signs. Of the heroic patience with which he endured his affliction for nearly ten years it is unnecessary to speak in detail, but it is important to mention that during all

this time he never lost his interest in birds. In spite of suffering and sorrow he kept fully informed of the progress of the work, was always interested in reading about his favorite subject and whenever possible insisted on attending the annual meetings of the National Association of Audubon Societies and on one or two occasions the meetings of the Union. The last meeting of the Union at which he was present was that held in New York on the historic occasion of Armistice Day, November 11, 1918. In spite of the confusion attending the celebration he made his way in charge of his nurse to the meeting of the council and after the routine business had been disposed of he produced a package and carefully unwrapping it exhibited a copy of Giraud's 'Birds of Long Island' with a photograph of the author and two autograph letters which he had treasured for many years. After some difficulty he made known that he wished the editor of the Union to prepare a biographical sketch of Giraud and his work for publication in 'The Auk.' This article prepared in accordance with his wish by Dr. Stone appeared in 'The Auk' for October, 1919, pp. 464-472, and may fairly be considered as Dutcher's last contribution to ornithology.

In this connection reference may be made to Mr. Dutcher's ornithological publications comprising about 100 titles which naturally fall into four groups: (1) A series of notes on the birds of Long Island; (2) a few general papers on birds; (3) a series of annual reports and brief notes on bird protection chiefly in connection with his work as chairman of the Bird Protection Committee and President of the National Association of Audubon Societies; (4) about twenty or more popular leaflets on common birds prepared for elementary instruction in schools and issued as part of the series of Audubon Educational Leaflets.

The notes on Long Island birds appeared mainly in the Proceedings of the 'Linnaean Society' and in 'The Auk' and contain many records of value and of considerable local interest. Many of these notes together with unpublished material from his note books, were incorporated in Dr. Braislin's 'Birds of Long Island' 1907, and also in Eaton's 'Birds of New York' 1910-14. Among his general papers the most important were those summarizing

existing information in regard to the Labrador Duck¹ in which were brought together all the records then available and a list of the known specimens which increased the total number from 33 to 42. Later, in connection with W. L. Baily he published² an important 'Contribution to the life history of the Herring Gull (*Larus argentatus*) in the United States,' a bird in which he was greatly interested and to which he had given special attention for some years. Among the bird protection papers mention should be made of his 'History of the Audubon Movement from 1883 to 1904'³ and 'Some Reasons Why International Bird Protection is Necessary,'⁴ the latter presented before the International Congress in Berlin.

When it is realized that Dutcher's writing was nearly all done at night or in leisure hours after a busy day at the office with all the disturbances and routine details incident to an active business life, the wonder is not that he did not write more but that under the circumstances he was able to accomplish so much. Writing with him was a somewhat serious and laborious occupation. He always wrote out his papers in long hand, but the actual writing was rather a pleasure than otherwise for his handwriting was beautifully distinct and legible and he took great pride in it. His signature was remarkably clear and he always took time to give each letter its proper form. In preparing his papers his main object was a clear and accurate statement of facts and he frequently spent much time in correcting and rewriting his manuscript so that his ideas might be expressed in the precise form in which he wished them stated. This was especially so in the case of his annual reports and his educational leaflets. The subjects of his papers were usually matters of personal observation or work which he deemed important to place on record, such as notes on the occurrence or habits of certain birds or reports on his activities in bird protection. Some were more or less didactic such as his leaflets for use in bird study in the schools or the

¹ 'The Auk,' VIII, pp. 201-216. April, 1891; XI, pp. 4-12, 175-176. 1894.

² 'The Auk,' XX, pp. 417-431. Oct., 1903.

³ Bird Lore, VII, pp. 45-57. Feb., 1905.

⁴ Bird Lore, XII, pp. 169-172. 1910; Verhandlungen V. Int. Orn. Congress, pp. 858-882, Berlin, 1911.

statements for use in connection with legislative measures. His reports as chairman of a committee or president of the National Association of Audubon Societies were not mere statements of routine business, but were complete records of the work accomplished during the year with suggestions or outlines of future activities.

It will be noticed that Dutcher's most important work lay in the field of applied ornithology and especially in bird protection. It was his ambition to have the more important facts of economic ornithology and the life histories of birds put in clear and attractive form so that they would interest the general public and could be available for educational purposes. In this way he hoped to restrict the wholesale slaughter of birds for millinery purposes or for sport and to prevent the extermination of certain species which seemed doomed to follow in the wake of the Great Auk the Passenger Pigeon and the Labrador Duck. His active interest in conservation began many years before the now familiar term 'conservation' came into general use. As early as 1887 he introduced at one of the meetings of the Linnaean Society a resolution for the protection of the Yellowstone National Park so that his activities in behalf of bird protection extended over a period of more than a quarter of a century. In this field he almost always worked through some committee or organization, realizing that in this way he could command more support and make his energy count for more before the public or in legislative matters than by his own unaided efforts. It made little difference whether he served as chairman or not, as he entered into the work with vigor and enthusiasm and soon became one of the most active members of the committee.

In personal appearance Mr. Dutcher was somewhat above average height, dignified and rather serious in manner but always very approachable. He invariably commanded respect by his fairness and by his earnest manner and was able to hold the attention even of an unsympathetic audience at a legislative hearing. He made friends easily, was always glad to meet his friends and acquaintances, and was cordial even to strangers. He was particularly interested in young men and ready to aid them in





1. BROWN PELICANS, OLD AND YOUNG, LEAVING DUNHAM'S ISLAND, TEXAS.
 2. YOUNG WHITE PELICANS ON NESTING GROUNDS, LITTLE BIRD ISLAND, TEXAS.
 3. A GROUND NEST OF THE REDDISH EGRET, BIG BIRD ISLAND, TEXAS.
- FROM 'BIRD-LORE.'

any way. Several ornithologists now well known can doubtless recall the assistance which he rendered them in the early days of their study of birds. At the meetings of the Union he made it a point to become acquainted with the younger members and many of these visiting New York were from time to time invited to his home. While rarely referring to religious matters he was in fact almost as much interested in his church work as he was in civics and for many years was a vestryman in the Episcopal Church. Quiet and unostentatious, he never missed an opportunity to extend a helping hand to any who needed it and many private deeds of charity should be placed to his credit. To one in need he spared no effort to render such assistance as he could. Wherever he went he made friends and while in his legislative work he necessarily had opponents it is doubtful if he had any actual enemies. To know William Dutcher was a privilege, to work with him was an inspiration.

1939 Biltmore St., Washington, D. C.

NOTES ON THE BIRD-LIFE OF SOUTHEASTERN TEXAS.

BY T. GILBERT PEARSON.

Plates XVI-XVII

DURING the spring of 1920 a field trip in the interests of the National Association of Audubon Societies took me into southeastern North Carolina, southern Mississippi, western Louisiana, and southeastern Texas. The region covered in Texas has been so little visited by ornithologists of recent years that it is thought the following observations concerning some of the birds found in that territory may be worth recording.

Aboard the patrol-boat "Jim Duke," owned and operated by the Texas State Game, Fish and Oyster Commission, in company with William L. and Irene Finley, I cruised the various bays from Aransas Pass northward to Caranchua Bay, an offshoot of

Matagorda Bay, north of Port Lavaca. By means of launches and a sailing vessel I also investigated much of the waters of Corpus Christi Bay and Laguna de la Madre, going as far south as the southern end of Padre Island. The entire distance covered was in the neighborhood of two hundred miles. Some time also was spent in field observations at various places on the mainland, especially in the neighborhood of Brownsville and the town of Aransas Pass. My Texas field work covered the period from May 20 to June 7 inclusive.

1. *Larus atricilla*. LAUGHING GULL.—This was found to be an abundant species and was breeding at various points in the First and Second Chain of Islands just south of San Antonio Bay. On May 21 perhaps 800 pairs of these Gulls were nesting on a series of islands covering a distance of a mile or more just back of Harbor Island near Aransas Pass Inlet. Eggs were numerous, but no young were seen. Many nests were still in process of construction. An enormous colony, numbering perhaps 10,000 or more, was guarding nests and eggs on Big Bird Island on Laguna de la Madre on May 23.

Every Laughing Gull nest found on the Texas coast was built on dry ground, a location quite different from that prevalent on the Atlantic coast, where south of New England, they seem to be built mainly on the salt marshes.

2. *Sterna maxima*. ROYAL TERN.—Royal Terns were seen at numerous points in all the salt-water bays and lagoons visited. More than 200 nests were found on a small island, back of Harbor Island near the inlet of Aransas Pass. One of the largest breeding colonies I have ever seen was discovered on Big Bird Island in Laguna de la Madre, May 23. The eggs had been deposited in very slight depressions on the open beach and, as a rule, were from fourteen to eighteen inches apart. The areas thus covered were extensive. One such egg-field was fifteen by 84 feet. Another was eighteen feet wide and 120 feet long. Stepping off a space estimated to be ten feet square I found upon counting that the area contained sixty-two nests. By measuring the various egg-fields in a similar manner I computed the number of Royal Tern nests on Big Bird Island to be 3,456. About one nest in twenty contained two eggs, all others held but one. No young were found on any of the islands.

3. *Sterna sandvicensis aculeifrons*. CABOT'S TERN.—A colony of Cabot's Terns was found nesting on Big Bird Island in Laguna de la Madre on May 23. The eggs had been deposited on the bare sand in the manner employed by the Royal Terns. There was only one egg-field. This covered an area approximately 20 by 75 feet and was estimated to hold

892 nests. Only four nests contained two eggs. All others held but one. No young were found.

Many Gull-billed (*Gelochelidon nilotica*) and Caspian Terns (*Sterna caspia*) also were occupying the island. Numerous nests of both species containing eggs were examined and many young Caspians were seen.

4. ***Pelecanus erythrorhynchos*.** WHITE PELICAN.—It may not be known generally that of the numerous White Pelicans resorting to the coast of the Gulf of Mexico in winter a few remain when the great flocks move northward in spring. On June 12 and 13, 1918, I found about 70 among the Brown Pelicans at Timbalier Pass, Louisiana. So far as I am aware there has been no published record of their breeding in these southern waters. I was, therefore, greatly surprised on May 23, 1920, to discover a colony of nesting White Pelicans on Little Bird Island in Laguna de la Madre. Fifty adults were seen, eighteen young and fourteen eggs were counted. Photographs were secured of both old and young. The nests were on the ground and were composed of very small quantities of weed stalks and similar vegetation, which could readily be gathered locally. The birds were shy and the last ones left their eggs and young when we were still within 75 yards of them. They returned and passed overhead a few times, after which they settled on the water some distance away.

White Pelicans were seen at three other points on the coasts: one in a colony of Brown Pelicans on Dunham Island, Aransas Bay, May 26; two near Point Isabel, June 2; and about thirty near Green Island, Laguna de la Madre, June 3.

5. ***Pelecanus occidentalis*.** BROWN PELICAN.—When in 1918 I cruised the Gulf coast of the United States at the request of the Federal Food Administration to make a census of the Brown Pelican population and secure data on its feeding habits, I estimated the Brown Pelicans on the Texas coast not to exceed 5000. Owing to misinformation I did not at that time succeed in visiting all their breeding places. This survey I believe I have completed during the present season and I am of the opinion that my former estimate of their numbers was a liberal one.

On a small shell lump near Dunham Island, at the northern extremity of Aransas Bay, we found on May 26, a breeding colony of these birds. This little isle varied from fifteen to twenty-five feet in width and was about 150 feet in length. Young pelicans to the number of 304 were found and with the exception of about a half dozen all were large enough to leave the island and swim away upon our approach. As the young waddled over the shells twenty of them disgorged varying quantities of the fish they had lately consumed. An examination showed that with the exception of three mullet all were Gulf menhaden, fish never used for human consumption, but because of their oily character are undoubtedly nutritious for growing Pelicans.

Farther south, on Dead Man's Island, near Corpus Pass, a colony of

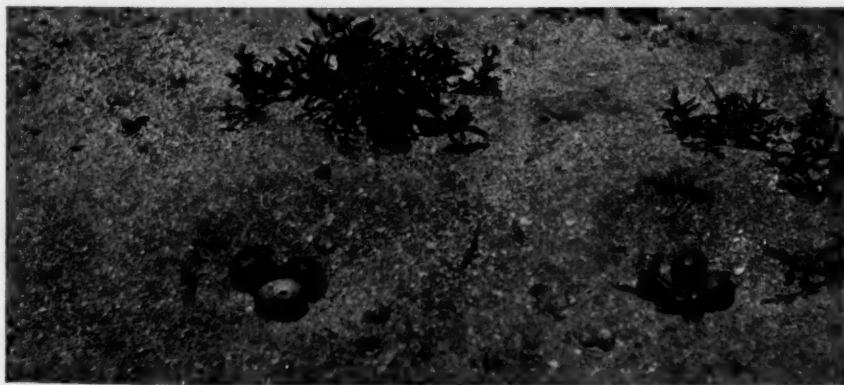
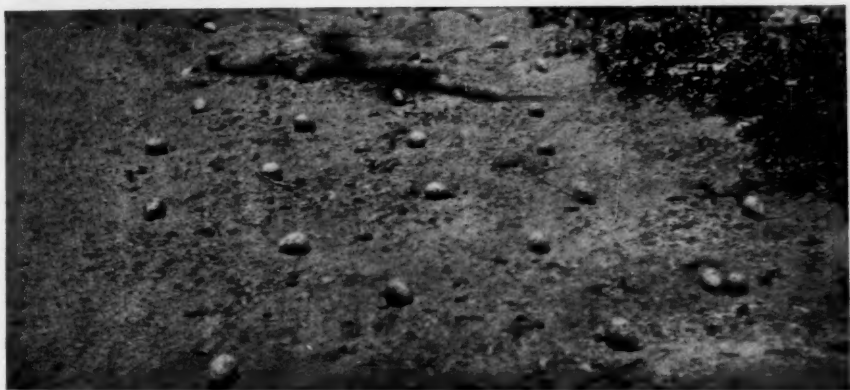
Brown Pelicans estimated at 2,000 was breeding. Here also the season for eggs had nearly passed. I have never seen any place where Pelicans were so tame as on Dead Man's Island. It was an easy task to stand in the open and repeatedly photograph the entire pelican population, the nearest birds being not more than fifteen feet distant. This visit was made on May 23.

The same day at Big Bird Island in Laguna de la Madre 48 pelicans nests were found. There were no young here. The number of eggs to the nest ranged from three to five. One nest, isolated from the others at a distance of at least 200 yards, was found to contain eighteen eggs! A pelican was sitting on them when we approached. There were no signs to indicate that eggs had been placed there by other than natural means, although it is hardly conceivable that one bird could have deposited so many.

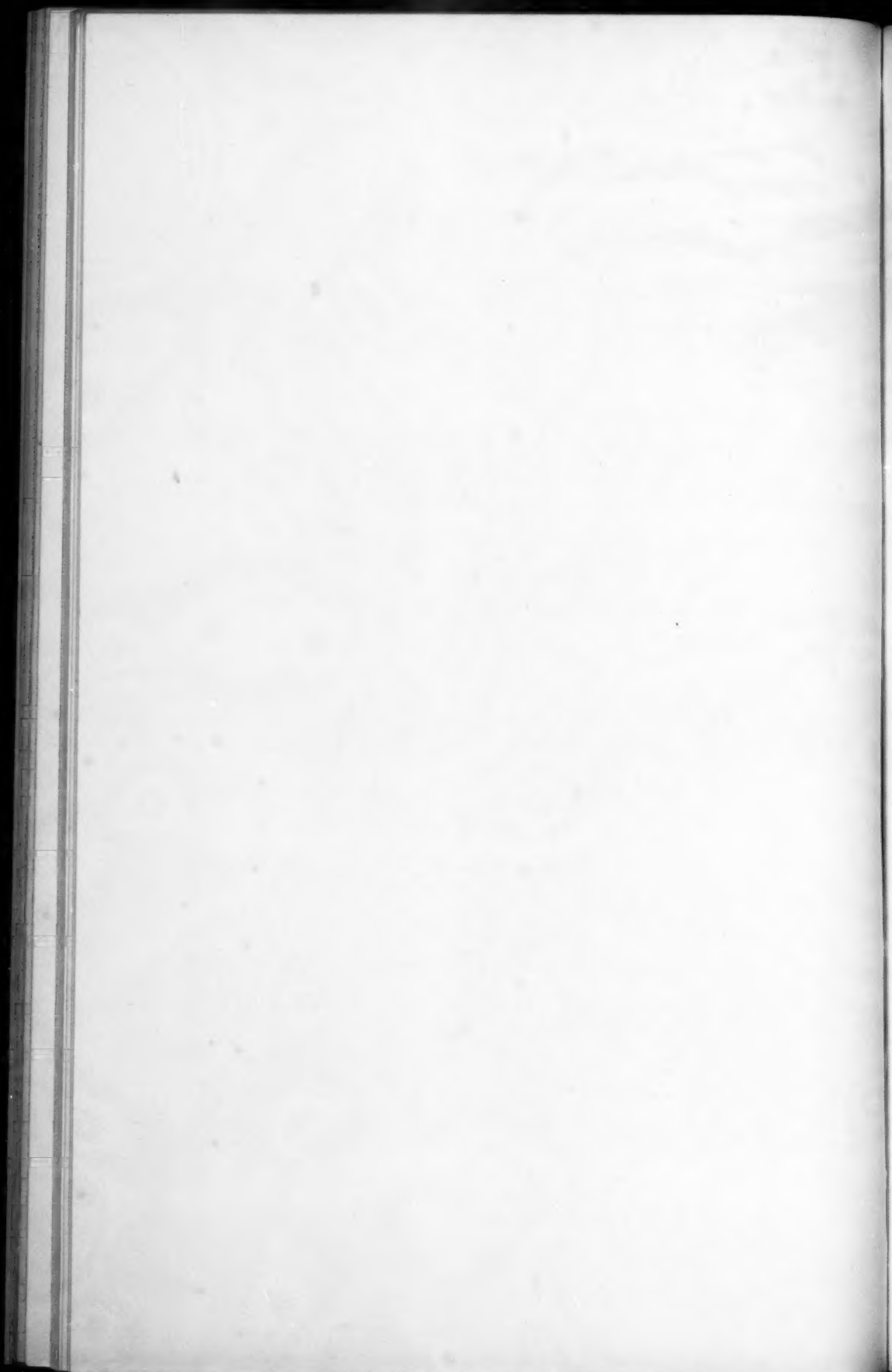
6. *Ajaia ajaja*. ROSEATE SPOONBILL.—On May 24, while driving in company with William L. and Irene Finley, at a point about five miles north of Aransas Pass, we came upon a flock of thirty-six Roseate Spoonbills. They were standing in shallow water on the leeward and sunny side of a thick tulé marsh. As they flew away we all remarked on the very dark appearance of one of the birds. A little later while we watched them feeding in a salt lagoon the dark bird was again in evidence. The next day at about the same hour we again found the flock resting at the identical spot by the tulés. It numbered forty-three on this occasion. While for twenty minutes Mr. Finley made moving pictures of them at a distance of 225 feet, Mrs. Finley and I again directed our particular attention to the peculiar member of the flock. The bird stood in a strong light and with field glasses we had every opportunity to examine it at leisure. The feathers of the entire neck, breast and most of the back were glossy black. Undoubtedly it was a melanistic specimen, one of those apparently rare occurrences among birds.

Spoonbills were noted elsewhere along the Texas coast as follows: May 26, five were seen in Mesquite Bay; May 27, flocks of six and twenty-six were observed in the same general neighborhood; May 28, eighteen were found near Port O'Connor, and the same evening two were discovered in Matagorda Bay. On May 28 at the southern end of San Antonio Bay, thirty-two were seen. On June 2, spoonbills to the number of eleven arose with a great flock of Wood Ibises from a lagoon between Brownsville and Point Isabel.

None were found breeding on the Texas coast. There is a widespread impression in this region that these so-called "flamingoes" breed early in Mexico and later migrate to Texas. This may be true of many but others probably breed in Texas as on May 18, 1920, I visited a colony of breeding spoonbills on Cameron Farm in Cameron Parish, Louisiana, at which date no young were seen. Five nests were examined and all



1. A CABOT'S TERN COLONY.
2. EGGS OF THE CABOT'S TERN.
3. NEST OF THE CASPIN TERN. ALL ON BIG BIRD ISLAND, TEXAS.
FROM 'BIRD-LORE.'



contained eggs. Eighty-seven spoonbills were here observed in the air at one time, and seventeen others were frightened from their nests immediately after this count was made.

7. *Casmerodius egretta*. EGRET.—This appears to be a rare species today along the lower Texas coast. Five individuals were seen during my trip to these waters in June, 1918. This year only two were identified with the exception of those found breeding on May 29 in a heron colony on Wolf Point Ranch, Caranchua Bay, in Calhoun County. Possibly fifty pairs were nesting here. Many young were out of the nests and climbing about over the bushes.

8. *Egretta candidissima candidissima*. SNOWY EGRET.—Snowy Egrets to the number of possibly 75 pairs were found breeding in the Wolf Point Ranch rookery on May 29. Young in various stages of growth were seen and a few nests held eggs. At least two pairs were breeding in the Green Island rookery, Laguna de la Madre, June 3. On May 28, five birds were seen on a sand point in Matagorda Bay and one was identified near Point Isabel on June 2.

9. *Dichromanassa rufescens*. REDDISH EGRET.—In 'Bird-Lore,' Vol. XX, page 384, I reported having found a breeding colony of these egrets on the Second Chain of Islands, north of Mesquite Bay, Texas, on June 20, 1918. A point of interest attaching to this discovery is that there appears to have been few, if any, records of this species breeding in the United States of recent years.

On May 21, 1920, I again visited this group of islands in company with Mr. and Mrs. Finley. The heavy growth of Spanish bayonet plants, mesquite and other bushes that covered the islands at the time of the former visit had largely disappeared and only a few dead mesquites were left. Furthermore the island chiefly occupied by the birds had been greatly reduced in size as a result of high storm tides. Six small islands of the group were this year found serving as nesting places for various herons. I estimated that about 500 pairs of Reddish Egrets were present. Perhaps the total population of Ward's Herons, Black-crowned Night Herons and Louisiana Herons numbered about the same. One young Reddish Egret in the white phase of plumage was found among the hundreds of young birds that were running about in the weeds under foot. One adult white bird was found dead beside its nest. These were the only white specimens seen.

Young in all stages were found and some nests contained eggs. The nests were in bushes, on drift, and on the ground. On one island, many had been built in wild sunflower plants at distances varying from one foot to three feet from the ground.

On Big Bird Island south of Corpus Christi, six Reddish Egrets were seen and two nests, one with eggs and one with young, were observed. These nests were on the ground.

On June 3, 1920, in company with R. D. Camp of Brownsville and George C. Shupe of San Antonio, a visit was made to Green Island lying in Laguna de la Madre 32 miles north of Point Isabel. So far as I am aware this island has been unknown to modern ornithologists. The greater part of its forty acres or more consists of a flat sand beach. Perhaps eight or ten acres is higher and this portion at its northern end rises to the height of fourteen feet, above the beach. The wooded area was found to be densely covered with a miscellaneous growth in which mesquite, prickly pear cactus, Spanish bayonet and maguey predominated. The whole brush-covered area was used by a breeding colony of herons that may have numbered from 5,000 to 10,000 birds.

The dominating species was the Reddish Egret. Thirteen adults in the white phase of plumage were counted. The remaining species in the colony consisted of Ward's, Louisiana and Black-crowned Night Herons in about equal numbers. A few Snowy Egrets also were present and breeding.

Reddish Egrets in small numbers were found on suitable feeding grounds at various points from Mesquite Bay southward to Brazos Pass at the south end of Padre Island.

10. *Ortalis vetula mcalli*. CHACHALACA.—Since this bird was first discovered in the United States by Sennett nearly thirty-five years ago very little has been written about its habits and activities, although it is known to be a resident in Cameron and Hidalgo Counties, Texas.

It is a bird highly esteemed for food and is relentlessly persecuted by local gunners. This, added to the fact that it is of very local distribution and the particular regions where it is found are rapidly being cleared for agricultural purposes, points strongly to its rapid disappearance from the United States. I talked with a gunner in Brownsville who stated he had hunted in that section every season for eighteen years but had never killed a Chachalaca nor had he been able even to see one. I had the good fortune to establish pleasant relations with two men who know many of the secrets of these birds and on June 6 they took me to a thick growth of scrub timber some eight or ten miles from Brownsville and introduced me to the Chachalaca.

The first ones found were an adult with two young running on the ground beneath the trees. Although both my companions saw them they escaped my notice. Five minutes later, however, one was pointed out sitting in a tree perhaps fifteen feet from the ground and within a few minutes I was able to get a not altogether satisfactory photograph of still another standing on a bare limb. A heavy rain storm ensued. As soon as the sun came out the Chachalacas appeared in all directions, usually standing in the tree-tops in such a manner that their heads were about on a level with the topmost leaves. Here while they dried their feathers they carried on a concert that we found highly exhilarating. We must have heard fifty calling that afternoon and as far as I could distinguish in every

instance but one the birds called in pairs. In calling there would be one loud note followed by two lower, shorter notes. Almost at the instant the second short note was given the other bird, presumably the female, in a higher pitched voice would give a loud call followed by two lower, shorter notes. Then her companion would instantly respond. The calling would continue with great intensity, volume and astonishing carrying power over a period of one minute or more. Vainly I strove to make the word "chachalaca" out of their notes, yet I presume it sounded as much like that word as anything else. Local white gunners call this bird the "Chatch-a-lac"; the Mexicans call it "Shack-a-lac-a." The notes reminded me of the cackling of guineas, and also of a medley of stringed instruments with a nasal tone running through it all.

I found the birds suspicious and very quick in detecting an intruder. When alarmed they produced a low cackling note repeated with rapidity and without modulation.

Those seen on dead limbs or in the open frequently took the attitude often assumed by turkeys when alarmed on a roost, the body, neck and tail assuming a straight horizontal position. Frequently one would alight on a twig so small that it would experience difficulty in retaining its perch, but even here with its great tail spread and round wings waving in an attempt to regain its balance, it was never too much engaged to begin instantly its wild song if its companion led the way.

Bendire in 'Life Histories of North American Birds,' quotes J. A. Singley as saying in connection with the nesting of the Chachalaca on the Lower Rio Grande:

"All the nests I found were in mesquite stubs, where the limbs had been cut off to make brush fences. The limbs were never cut close to the tree, and being close together form a cavity; leaves and twigs will fall in this and accumulate, and the bird occupies it as a nesting site. I did not find a nest that I could say was built by the bird."

The one nest pointed out to me as being of this species had the general flat appearance of a dove's nest, but somewhat larger and more substantial. It was on the limb of an ebony tree about eight feet from the ground.

Chachalaca eggs are frequently hatched under hens by the Mexicans and the birds afterwards kept in captivity. In Brownsville I saw one of seven that had been raised from nine eggs taken from three nests in 1919.

11. *Columba flavirostris*. RED-BILLED PIGEON.—This species was found on June 6 when visiting the territory occupied by the two colonies of White-winged Doves mentioned elsewhere. It is a handsome bird about the size of the Domestic Pigeon and locally known as the "Blue Rock." About fifteen of the birds were observed, some of them at a distance not greater than twenty yards. One was frightened from its nest in an ebony tree about seven feet from the ground. It was, for a pigeon, a fairly substantial one made of twigs and was placed on a horizontal limb. It contained one egg.

12. *Leptotila fulviventris brachyptera*. WHITE-FRONTED DOVE.—The peculiar, deep-throated notes of the White-fronted Dove were heard on eight occasions during the afternoon of June 6 while in the neighborhood of the White-winged Dove communities. Only one bird was seen and no nests were found.

13. *Melopelia asiatica*. WHITE-WINGED DOVE.—These birds were found to be very common in Cameron County. In passing along the roads in the neighborhood of Brownsville, one may frequently see them sitting on way-side posts or trees, or flying overhead, much in the manner of the Mourning Dove.

I had never read or heard that these doves accumulate in numbers to breed, and it was a source of much surprise to find them actually nesting in communities. About six miles east of Brownsville there is an extensive palm grove, known as Los Palmas. Nearby is a thick growth of huisache trees covering ten acres or more. Upon approaching this dense, scrubby forest my attention was immediately attracted by the cooing of doves and upon entering its almost impenetrable interior the impression grew that the whole world, so far as one could judge by sounds, was a wild natural dove cote.

In this area many hundreds of doves must have been nesting. The nests were not placed closely together as was the habit of the Passenger Pigeon, but several were readily found. Those examined all contained eggs. Two seemed to be the universal number. This was on June 1.

On June 6 I visited two other regions where the White-winged Dove was nesting in great numbers. These were located eight or ten miles in another direction from Brownsville. The spots selected consisted of very thick growths in which mesquite, huisache and ebony were noticeably abundant. Here likewise the number of doves was truly astonishing to one who had never seen representatives of this family nest, except in isolated pairs. Eggs and newly hatched young were found on this date.

The calls of the White-winged Dove can readily be distinguished from those of the other doves of the region. The most common note strongly suggests the hoot of the Great Horned Owl softened by distance. All three of these breeding places were in the immediate neighborhood of 'resacas' (ponds).

14. *Coragyps urubu*. BLACK VULTURE.—So far as I was able to determine this vulture out-numbered the Turkey Vulture along the lower Texas coast by at least ten to one. They were found at all the heron and Pelican colonies, where they doubtless feed on the many young birds that always perish about a rookery. One of the Audubon Association's wardens in Florida some years ago reported having seen these birds kill and devour the young of the White Ibis and it is of course possible that they engage regularly in such practices. On four occasions I saw Black Vultures fly out from thick growths of cactus and thorn bushes in such

manner as to indicate they had been frightened from their eggs or young. In only one instance did I penetrate one of these dense, thorny thickets in quest of the nest. This was on a small island about a mile from the Dunham Island Pelican colony. Two young that reminded one of large short-tailed roosters were found. They bit viciously when taken in the hand but otherwise were very gentle and posed admirably before Mr. Finley's moving picture camera. The black wing and tail feathers were in evidence, but otherwise their bodies were covered with a down, light brown in color and therefore noticeably different from the white of the young Turkey Vulture.

15. ***Crotophaga sulcirostris***. GROOVE-BILLED ANI.—Six of these birds we found in the scrub near Brownsville on June 6. On three occasions I listened to their somewhat harsh, oft-repeated notes. On the ground in a dense thicket I found the complete shells of two Ani eggs. Both were broken across the center and appeared to have been removed from the nest after the young had hatched. One Ani found in the immediate vicinity of the eggs was very tame and appeared reluctant to leave the neighborhood.

A short examination of the adjacent trees failed to reveal the nest and matters of a pressing nature prevented a more extended search.

16. ***Corvus brachyrhynchos brachyrhynchos***. COMMON CROW.—On Wolf Point Ranch in Caranchua Bay seven Common Crows were seen on the afternoon of May 28. Mention is made of this fact because of the rarity of the species in that part of the country. During the entire time spent in southeastern Texas these were the only crows observed, and the inhabitants of the country when asked about the bird uniformly stated that it was never seen in that region.

17. ***Megaquiscalus major macrourus***. GREAT-TAILED GRACKLE.—One of the most noticeable, noisy, and abundant species of birds along the lower Texas coast is the Great-tailed Grackle. It possesses an astonishing repertoire of whistles, calls, and guttural sounds and one sees or hears them everywhere. On islands surrounded by salt-water it is found and one may see it also about fresh-water ponds, or in the towns and on the high prairie or chaparral lands if water of any kind is in the vicinity.

These grackles are very active and the great, glossy, black males assume many striking attitudes. One of their favorite manoeuvres is for two to face each other, where with necks extended and with bills pointed directly upward to the extreme limit of possibility they will stand in a strained and rigid attitude for a time as if seeking to outdo each other in a contest of endurance.

On Big Bird Island in Laguna de la Madre, where there was a total absence of trees or bushes, the grackles had built their nests in weeds from one inch to a foot and a half from the ground. I found their nests

in the heart of a tule marsh near Aransas Pass and in all the heron colonies visited.

Near the main buildings on the Wolf Point Ranch in Calhoun County, the prairie is decorated by two "motts." In local usage the word "mott" means a thick growth of slender live-oak trees. The combined area of these two motts is certainly not over an acre and a half in extent, yet they held on May 29, not less than 1,000 nests of the Great-tailed Grackle. The noise produced by the birds could be heard from the deck of the yacht where we lay at anchor half a mile distant.

As mentioned above these birds were found in all the heron rookeries I visited, nor did they display any hesitancy in placing their nests in the immediate proximity of those of other species. An extreme example of this custom which also serves to illustrate how many birds may crowd their nests together when good sites are scarce, was found in one of the colonies on the Second Chain of Islands group.

A dead and uprooted mesquite bush was found, the entire top of which was covered by two Ward's Herons nests. One held five eggs and the other was the home of three large young that walked off and climbed to the ground, as we approached. These nests were only about five feet from the ground, yet beneath them and in the same bush were found the following occupied nests; three of the Louisiana Heron, two with young and one with eggs; one of the Black-crowned Night Heron with three young, and four nests of the Great-tailed Grackle all containing young. Nor was this all, for on the ground under the bush was an unoccupied nest of the Ward's Heron and a Reddish Egret nest with two eggs and the white parent lying dead beside it.

In addition to the above many other species were observed and more or less notes made of their nests, feeding habits, or distribution. Among these were the following:

- Sterna antillarum*. LEAST TERN.
- Hydrochelidon nigra surinamensis*. BLACK TERN.
- Rynchops nigra*. BLACK SKIMMER.
- Anhinga anhinga*. WATER TURKEY.
- Phalacrocorax vigua mexicanus*. MEXICAN CORMORANT.
- Fregata aquila*. MAN-O'-WAR-BIRD.
- Anas fulvigula maculosa*. MOTTLED DUCK.
- Marila valisineria*. CANVAS-BACK.
- Plegadis guarauna*. WHITE-FACED GLOSSY IBIS.
- Butorides virescens virescens*. GREEN HERON.
- Fulica americana*. COOT.
- Himantopus mexicanus*. BLACK-NECKED STILT.
- Catoptrophorus semipalmatus inornatus*. WESTERN WILLET.
- Oxyechus vociferus*. KILLDEER.
- Ochthodromus wilsonius*. WILSON'S PLOVER.
- Arenaria interpres morinella*. RUDDY TURNSTONE.

Haematopus palliatus. OYSTER-CATCHER.
Colinus virginianus texanus. TEXAS BOB-WHITE.
Zenaidura macroura carolinensis. MOURNING DOVE.
Chaemepelia passerina pallescens. MEXICAN GROUND DOVE.
Scardafella inca. INCA DOVE.
Polyborus cheriway. AUDUBON'S CARACARA.
Geococcyx californianus. ROAD-RUNNER.
Ceryle americana septentrionalis. TEXAS KINGFISHER.
Dryobates scalaris bairdi. TEXAS WOODPECKER.
Centurus aurifrons. GOLDEN-FRONTED WOODPECKER.
Chordeiles acutipennis texensis. TEXAS NIGHTHAWK.
Muscivora forficata. SCISSOR-TAILED FLYCATCHER.
Pyrocephalus rubinus mexicanus. VERMILION FLYCATCHER.
Otocoris alpestris giraudi. TEXAS HORNED LARK.
Xanthoura luxuosa glaucescens. GREEN JAY.
Agelaius phoeniceus richmondi. VERA CRUZ RED-WING.
Sturnella magna hoopesi. RIO GRANDE MEADOWLARK.
Cardinalis cardinalis canicaudus. GRAY-TAILED CARDINAL.
Passerina ciris. PAINTED BUNTING.
Spiza americana. DICKCISSEL.
Vireo belli belli. BELL'S VIREO.
Mimus polyglottos leucopterus. WESTERN MOCKINGBIRD.
Toxostoma longirostre sennetti. SENNETT'S THRASHER.
Toxostoma curvirostre curvirostre. CURVED-BILLED THRASHER.
Baeolophus atricristatus atricristatus. BLACK CRESTED TIT-MOUSE.
 1974 Broadway, New York.

THE LATER FLIGHTS OF THE PASSENGER PIGEON.

BY FRANK BOND.

Plate XVIII.

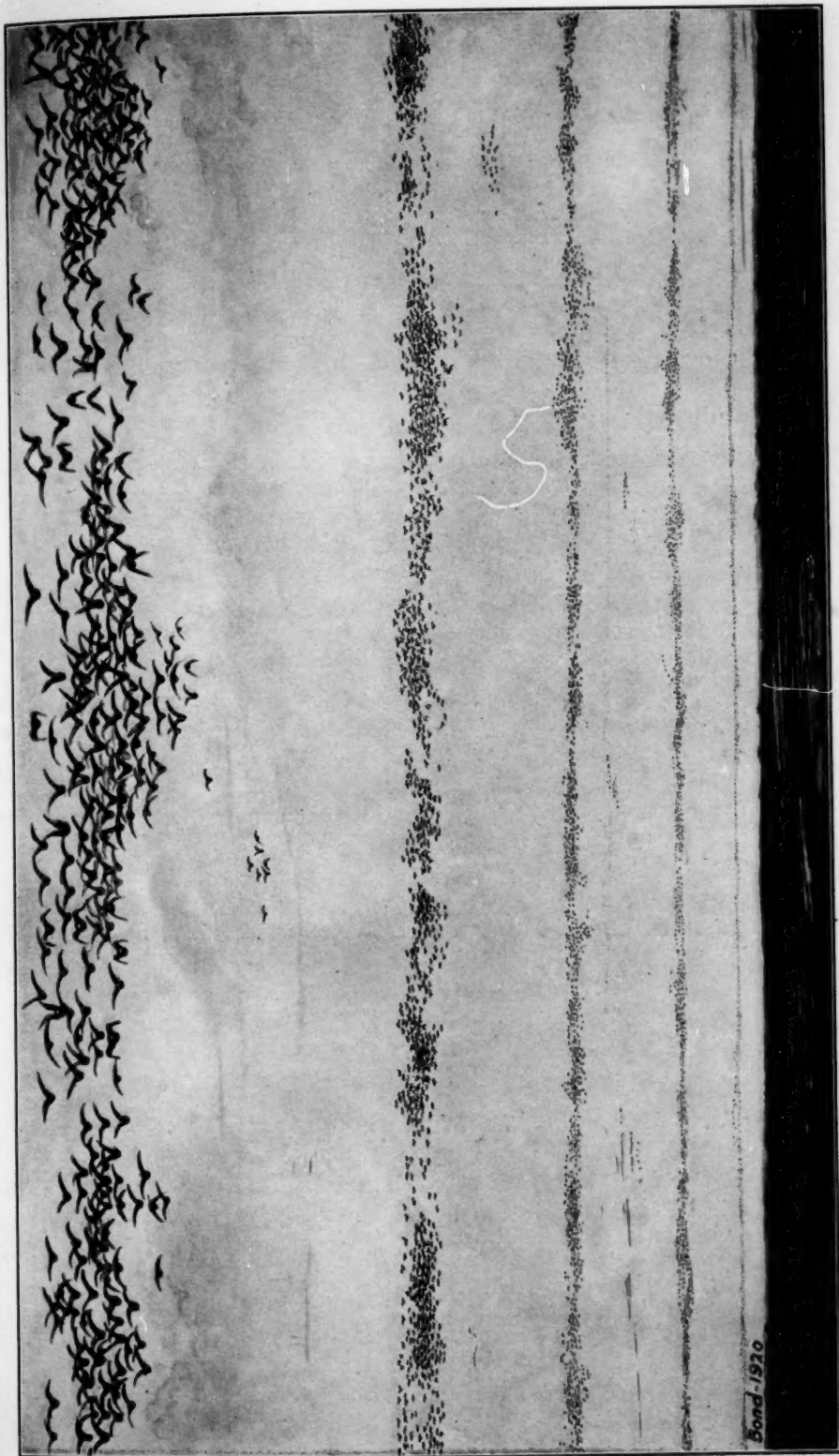
BETWEEN the years 1872 and 1875 or 1876, eastern Iowa, for a distance of sixty or more miles west of the Mississippi River, witnessed many intermittent flights of the fast dwindling flocks of the Passenger Pigeon. At that time I was not familiar with

the stories of the pigeon flights over Ohio and Kentucky and other territory east of the Mississippi, related by Wilson and Audubon, or, probably, I should have been impressed with the difference between flights occurring prior to 1845 and those between 1870 and 1880. It will be recalled that Wilson and Audubon described the pigeon flocks as being so vast in extent that they darkened the sky for several successive days. As I read their descriptions, the pigeons literally spread a dark blanket of roaring wings over the earth, interfering with the light from the sun to the extent that a twilight condition prevailed not only all day but for several days in succession.

The rapid destruction of the pigeons between the dates mentioned should, one would think, have warned thoughtful students of wild life of the complete destruction of this edible species at an early date, but if fears existed the publications of the period do not appear to have been utilized for the purpose of arousing public interest and concern therein. So to us in the 70's the flights of pigeons seemed tremendous and were wholly without a warning thought or suggestion that the hundreds of thousands, or possibly millions, we saw passing over were but the fast disappearing remnants of the billions that turned day into night much less than fifty years before.

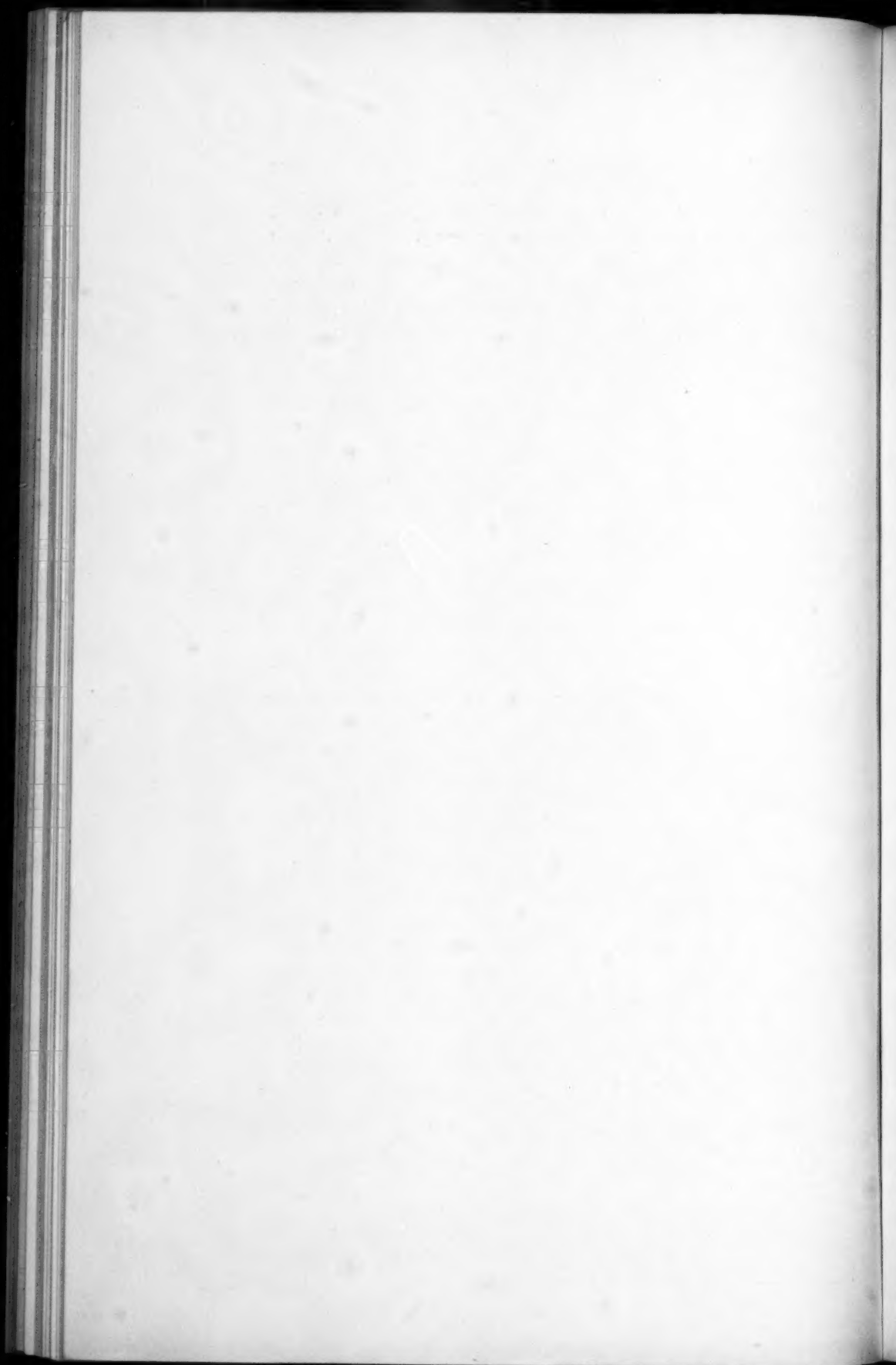
These later flights of the Passenger Pigeon were unlike those described by Audubon and Wilson. They were as direct, as swift, as full of evident purpose, as those of the earlier years, but the sadly reduced numbers of the birds did not permit of clouds that blanketed and darkened the skies.

I have presented herewith a reproduction of a water color sketch of the pigeon flights of the early 70's, as I remember them. The birds flew in long lines or ranks, endless as far as we could see, extending from one horizon to the other, or at least far enough for the ends of the lines to be swallowed up in the haze and mists of distance. These lines were by no means uniform in density throughout. The birds were unevenly distributed. At times there would be larger and denser bodies, often connected by continuous thinner lines, or even separated here and there by an open space, or a space containing so few birds as to appear open



A FLIGHT OF PASSENGER PIGEONS.

FROM A PAINTING BY FRANK BOND.



at a distance. These tremendous lines of pigeons were followed by others like them, at distances apart, as I recall them, varying from a few hundred yards to a half mile or more. I can only estimate these distances from my memory of the picture the sky offered at the time. They are rough estimates only, but I remember distinctly that while the long extended lines were parallel the distances between them varied greatly. Then there was one other interesting feature of these flights that, had Audubon observed them, would very likely have suggested to his mind that even yet there lingered traces of flight instinct of the years when billions darkened the sky in impenetrable formation. Scattered at haphazard between the great bodies moving with military precision were irregular smaller flocks, varying in number from perhaps a dozen to fifty birds. Whether these had pushed ahead because of their hurry, had fallen back because of weariness, or whether accident in organizing the original flight formation was the reason for this independent and apparently unorganized flight, is open to conjecture. They looked somewhat like small scouting parties, watchful for the safety of the main armies with which they moved.

Upon reading this paper before the 1920 meeting of the American Ornithologists' Union, the question arose in discussion whether the flocks were spread out laterally or lengthwise in the line of flight like crows, and I would repeat that in my experience they were always spread out laterally as shown in my painting, advancing on a wide front.

It may be interesting also to give a brief description of one of the feeding habits of the Passenger Pigeon which I observed during the period of these pigeon flights and with which I interfered to the extent of my ability, using as a weapon an old army musket which had seen service in the Civil War but which had been smooth-bored to meet the requirements of peace conditions. Among other farm activities my father fattened cattle for the Chicago market, stuffing them chiefly with corn raised on the farm. This feeding was carried on during the winter months and when ready for the market the animals were shipped in the early spring, I think early in March, and of course the grounds of the stock-

yards, containing several acres, were covered, in fact buried deeply, with lost and partially digested grains of corn. This feast the pigeons discovered daily and thousands of them swooped down into the deserted yards until the grounds were swept clean. Here was good hunting, pot hunting pure and simple, for while the birds were most abundant no musket was aimed at a single bird on the ground or in a tree top, much less in flight. The pigeons in flocks of thousands would alight on the ground, and in the manner of domesticated pigeons, with which all are familiar, move rapidly, watchful for the corn around them, picking up the grains nearest and then, necessarily and constantly, moving forward. Of course they soon discovered that the birds in the front rank got the grain and so was presented an interesting phenomenon. It might possibly be likened to a moving waterfall, for the birds in the rear of the progressing flock continually took the air and in large numbers dropped down just in front, where the grain was plentiful.

The stockyards were located just in the edge of heavily timbered lands containing many species of acorn bearing oaks, walnut and butternut trees, and in the open glades hazel bushes. In March, of course these trees were bare of leaves and the pigeons would alight in their tops so densely that the pot shot always brought down many.

I do not know the last year the Passenger Pigeons were seen in eastern Iowa. I left the State in March, 1882, and have never returned to the woods and farm in Johnson County to which these memories have carried back. I may say, however, that for a number of years after the flights and feeding of pigeons which I have briefly described, a few birds were killed annually in the mast bearing woods of the neighborhood.

I recall seeing but the small straggling remnants, little flocks of four to six or seven birds possibly. These foraged in the tree-tops and were extremely wild and unapproachable, but what should one expect during those last days of their rapidly enforced flight toward extinction? Their going out of the world for all time suggests the similar experience undoubtedly had by the unknown and harmless race of men who, in their final struggle

for existence many centuries ago, fled from their persistent enemies to the high and inaccessible cliffs of the arid southwest, and there, in rapidly dwindling numbers, eked out a meager and miserable existence until all were gone.

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REMARKS ON THE MIGRATION OF SOUTHERN HEMISPHERE ALBATROSSES AND PETRELS.

BY LEVERETT MILLS LOOMIS.

No other migratory movements illustrate the migration of birds better than those of the albatrosses and petrels breeding in the Southern Hemisphere. With the close of the season of reproduction, there are northward movements that stop short of the equator, transequatorial ones to northern latitudes, and movements that lead in a southward direction.

The migratory movements that fall short of the equator are well exemplified in the Antarctic Fulmar (*Thalassoica antarctica*), Snowy Petrel (*Pagodroma nivea*), Lesson's Petrel (*Pterodroma lessoni*), and White-chinned Petrel (*Procellaria aequinoctialis*).

Transequatorial migration to northern latitudes is typically illustrated in the Juan Fernandez Petrel (*Pterodroma externa*), Neglected Petrel (*Pterodroma neglecta*), Mottled Petrel (*Pterodroma inexpectata*), Great Shearwater (*Puffinus gravis*), Cooper's Shearwater (*Puffinus creatopus*), Flesh-footed Shearwater (*Puffinus carneipes*), Sooty Shearwater (*Puffinus griseus*), Slender-billed Shearwater (*Puffinus tenuirostris*), and Wilson's Petrel (*Oceanites oceanicus*). The Sooty Shearwaters occurring in myriads on the Pacific Ocean off Point Pinos, California, shed a flood of light upon this phase of bird migration. On their arrival in spring, the adult ones are in worn plumage, and have dormant

gonads. As the season advances, they undergo a complete moult, and in autumn, at the time of the departure of the hosts, they are in fine feather, and display great functional enlargement of the gonads. The period of absence of this petrel from California waters coincides with its breeding season in the South Temperate Zone. It has long been a matter of record that there are breeding stations of this petrel in the New Zealand area, and recently Mr. R. H. Beck has located such a station on Wollaston Island, near Cape Horn.¹ Transequatorial migration from the Southern Hemisphere finds a counterpart in transequatorial migration from the Northern Hemisphere.

Migration after the breeding season in a direction leading away from the equator is well shown in the Galapagos Albatross (*Diomedea irrorata*), which breeds, so far as known, only on Hood Island (lat. 1° 25' S., long. 89° 42' W.), and journeys at least as far as Independencia Bay, Peru, lat. 14° 16' S.² This migratory movement corresponds to that of the Black-vented Shearwater (*Puffinus opisthomelas*) of the Northern Hemisphere.

The various types of migration occurring north and south of the equator adjust the bird population of the world to the seasons. It is therefore in the evolution of existing climatic conditions that we find the remote cause of present-day migration. In accounting for the immediate cause, it does not seem necessary to place heavy additional burdens upon heredity. The traveling habit, formed from the example of older birds, would seem incentive enough to cause an adult Galapagos Albatross to make the round trips between Hood Island and Independencia Bay. If the young are endowed with an innate desire for travel, the traveling habit would not be less readily formed. In short, bird migration is viewed as an inheritance in the species and as an acquired habit in the individual.

In considering the return journeys of the Galapagos Albatrosses to Hood Island, we are confronted with the question, how do migrating birds find their way over the ocean. Are they guided

¹ Amer. Mus. Journ., 1918, p. 111.

² Cf. Coker, Proc. U. S. Nat. Mus., Vol. 56, pp. 461, 462: cf. Proc. Calif. Acad. Sci., Ser. 4, Vol. 2, Pt. 2, pp. 75, 76.

by an unexplained sense of direction, or are they guided in their course by landmarks when near the land and by persistent water and air currents when remote from the land? The question is fairly before us, and we must answer it with evidence. Apparently direct evidence is found in the behavior of shearwaters beset by fog off the California coast. The following is selected from the record of a series of observations made by myself some years ago:¹

September 26. As soon as the boat was fairly clear of the land, flocks of shearwaters, hurrying along the south shore of Monterey Bay, were dimly discernible through the fog. Before Point Pinos was reached, it was manifest that there was an extensive movement in progress. At the outset Sooty Shearwaters were well represented, but in a little while only the Black-vented appeared in force. After passing Point Pinos, instead of altering their course and heading south as is their wont when the coast is clear, all the shearwaters proceeded directly out to sea. The fog was so thick, that the outlying rocks at Point Pinos could scarcely be perceived from the kelp. The coast-line to the southward of Point Pinos was invisible, and the ocean seemingly boundless space, where the birds apparently lost their bearings and became bewildered, for a return movement set in when the fog was densest. At the same time others continued to arrive from up the coast; the outward-bound ones passing close to Point Pinos and the inward-bound ones in the vicinity of the whistling buoy, anchored several hundred yards offshore. After a while many flew about at random and a large flock congregated on the water. When the shore-line south of Point Pinos became visible, the birds immediately resumed their journey southward.

October 2. At seven in the morning, flocks of Black-vented Shearwaters were passing along the south shore of Monterey Bay, almost at the surf, a thick fog hiding the land. They came from the east and disappeared in the west. Following in their wake, I soon discovered that close to the shore an avenue of flight was established, along which many flocks were heading toward

¹ Proc. Calif. Acad. Sci., Ser. 3, Vol. 2, pp. 281, 284.

the ocean at Point Pinos. They displayed an unusual timidity, sheering wildly from the boat as it loomed up before them out of the fog. The belt of kelp and the land seemed also to fill them with fear, those happening between these bugaboos being in especial straits, shunning first the one and then the other. By the time I reached Point Pinos orderly movement had nearly ceased, confusion reigning. The birds were flying about in all directions—those in extreme bewilderment, in circles. Between half past nine and ten, the fog lightened sufficiently to reveal the shore-line south of Point Pinos, and immediately order was restored, and regular progress southward resumed.

If migratory birds are endowed with a superhuman sense of direction, tantamount to a sixth sense, why were these shearwaters bewildered when the land was hidden by fog? Why did they immediately proceed on their journey when the fog was dispelled sufficiently to reveal the landmarks? If they had possessed any directing faculty other than the faculty of locating position by observing physical phenomena, it would not have failed them in these instances.

The Brandt's Cormorants nesting in the vicinity of Point Pinos and my boatman had no difficulty in finding their way in the fogs that bewildered the shearwaters. They were at home on this bit of coast, and in consequence kept their bearings in the fog. But the shearwaters migrating down the coast had no opportunity of determining their position by local landmarks, and consequently lost their way like the captain of a coaster who beached his vessel, on a still, foggy night, two miles south of Point Pinos, supposing that he was entering Monterey Bay.

It is clear that Galapagos Albatrosses in returning from mainland waters to their rookery on Hood Island must have other means of guidance than landmarks. A glance at a current chart reveals that the cold Humboldt Current, "with its steadily and visibly flowing waters," leads directly to the Galapagos Islands. A physical means of guidance is therefore not wanting.

In plotting the metes and bounds of all the albatrosses and petrels, it has been disclosed that the trade-winds apparently form habitat boundaries. For example, in the Southern Hemisphere,

away from the influence of the land, the northward range of certain species appears to end at the southern limits of the south-east trades; as in the Wandering Albatross (*Diomedea exulans*), Long-winged Petrel (*Pterodroma macroptera*), and White-chinned Petrel (*Procellaria aequinoctialis*). In the Northern Hemisphere, a corresponding restriction of range seemingly occurs in the Black-footed Albatross (*Diomedea nigripes*).

The behavior of the Shearwaters in the fog off the California coast, the existence of a definite waterway between the mainland and Hood Island, and the apparent influence of the trade-winds in limiting habitats, seem to justify the conclusion that migrating birds are guided by physical phenomena, and not by a mysterious sense of direction. In fine, the solution of the problem is not found in the marvelous.

It has been well said: "The day is passing when scientists seek to employ striking or extraordinary phenomena in the solutions of their problems; rather are they looking to that which appears insignificant and commonplace."

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THE ABBREVIATED INNER PRIMARIES OF NESTLING WOODPECKERS

BY JAMES P. CHAPIN

Plate XIX

WHILE examining nestlings of Woodpeckers, some years ago, belonging to the African genera *Chrysopicos*, *Campethera*, and *Dendropicos*, I noticed that the innermost primary of the first or "juvenal" set of remiges was always remarkably small and weak, (Fig.1) and thus utterly unlike its representative in the adult plumage. There, on the contrary, the first primary is nearly as long as the second and third, thus filling its place normally in the graded series of wing-quills. The young of another African wood-peck-

er, *Mesopicos goertae*, likewise showed reduction of the same¹ quill, but somewhat less in degree.

The term "juvenal" is here employed in the sense proposed by Dr. Dwight² as the name for the plumage immediately succeeding the natal down, or where there is no such down, as in the Picidae, for the first plumage of the young bird.

In order to see this tiny feather, however, it is essential to have very young individuals, with the loerng primaries not yet com-



Fig. 1. *Dendropicos poecilolaemus*. First innermost primary in (A) juvenal and (B) adult plumage of female. $\times 1$.

pletely grown, for as soon as the latter have attained their full length the diminutive feather is at once molted, and its replacing quill comes in as large as that of adults. Thus a young wood-pecker which has already left the nest will seldom show the juvenal first primary. With the renewal of this first primary begins the post-juvenal molt of the remiges, so characteristic of young woodpeckers, ushering in the normal adult proportions of the wing.

So far as I am aware, no writer has yet called attention to this unique phenomenon, which cannot be exactly compared to the reduction of the first (outermost) secondary in the Phasianidae, since the feather there remains small throughout life, nor to the retarded development of the outer juvenal primaries in this same family and in *Opisthocomus*,³ where they are not preceded by any small fore-runners.

Wondering whether this condition was of common occurrence among young Picidae, I next examined the nestlings of some of our common American species, and found that in the flickers a

¹ In this article the primaries will be numbered from the carpus outward.

² *Annals N. Y. Acad. Sci.*, XIII, 1900, p. 106.

³ See Pycraft, *History of Birds*, 1910, pp. 242-244.

still more unusual case presented itself, inasmuch as *two* inner primaries were shortened. The young Hairy and Downy Woodpeckers, likewise, had both the first and the second primaries dwarfed. Here again these reduced feathers are lost, and replaced by very much larger ones, at the outset of the post-juvenal molt.

In Mearns' Woodpecker and the White-headed Woodpecker both the first and the second primaries show similar arrested development in the juvenal plumage; but in the Red-bellied Woodpecker it is clear that the second is not affected, becoming at once full-sized, while the dwarfed first primary is shed at a very early date. The Haitian *Centurus striatus* resembles the Red-bellied; and the young Red-headed Woodpecker, similarly, has not more than one inner primary of reduced proportions. In the last-named species the post-juvenal molt, as Dr. Stone has pointed out,¹ is greatly retarded. So while the first primary is renewed at a time earlier perhaps than in other woodpeckers, all the remaining primaries are retained until about December. This is easily determined from the duller coloration of the juvenal quills.

To Mr. Outram Bangs I owe the opportunity of examining a nestling Ivory-billed Woodpecker, which I find to have the second primary markedly reduced, and the first apparently even more so. Still, the first juvenal feather has perhaps already been shed, and the young feather now wholly enclosed in its sheath may be a representative of the succeeding or "first winter" series. Young specimens of three South American species often referred to *Campephilus*, however, which are just renewing the first primary, show clearly that there is no reduction of the second quill—a surprising difference from the North American species. In a member of the Pileated group on the other hand, *Ceophlæus lineatus*, from Mexico, both the first and second primaries of the nestling's wing undergo reduction.

Among European woodpeckers, the Green Woodpecker and the Great Spotted Woodpecker were next examined, and both of them were found to have two inner primaries of dwarfed size in the juvenal set (Fig. 2). *Xiphidiopicus percussus* of Cuba and *Hypoxan-*

¹ Proc. Acad. Nat. Sci. Phila., 1896, p. 129.

thus *rivolii* of Ecuador have only one inner primary reduced, about as in *Chrysopicos*. In the U. S. National Museum there were specimens, sufficiently young, of two East Indian forms, *Tiga javanensis* and *Meiglyptes grammithorax*, which showed a single reduced primary, the first, in each case. That of *Meiglyptes* was decidedly small, but in *Tiga* the feather was of the same relatively large size as in *Mesopicos goertae*.

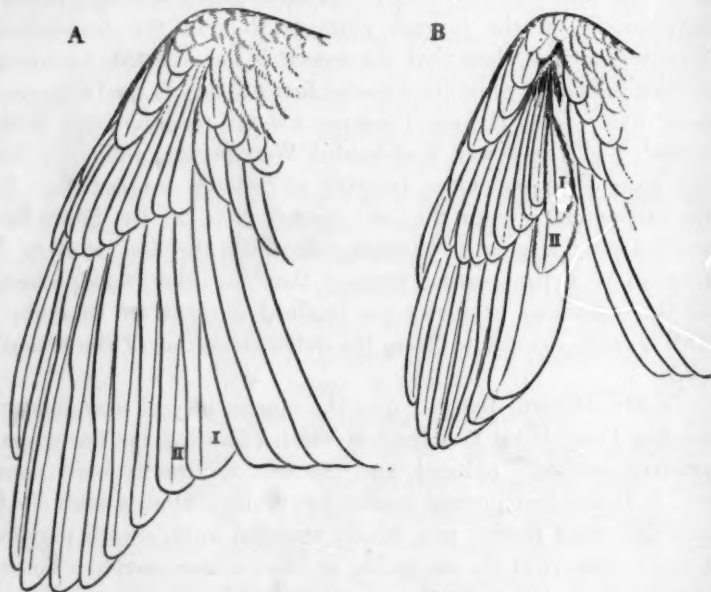


Fig. 2. *Picus viridis*. Wing of (A) adult; (B) Young, from above. $\times \frac{1}{2}$

By this time it was only natural that I should conclude the reduction of one or more inner primaries of the nestling to be a family character of the Picidae. The piculets, to be sure, might not exhibit it, for three rather young, though fully fledged, specimens of *Verreauxia africana* failed to show reduced wing feathers or even a subsequent post-juvenal molt. Yet they perhaps represent a family apart, more similar to the barbets than are the true woodpeckers.

Great was my surprise, consequently, on examining a nestling of the Yellow-bellied Sapsucker, Fig. 3. to find that none of the inner primaries, not even the first, was any smaller relatively than it would be in the adult. The same was true of the wings of fledglings in the Red-naped, Red-breasted, and Williamson's Sapsuckers; so the genus *Sphyrapicus*, as a whole, offers a notable exception to the general rule of reduction, or more accurately speaking,

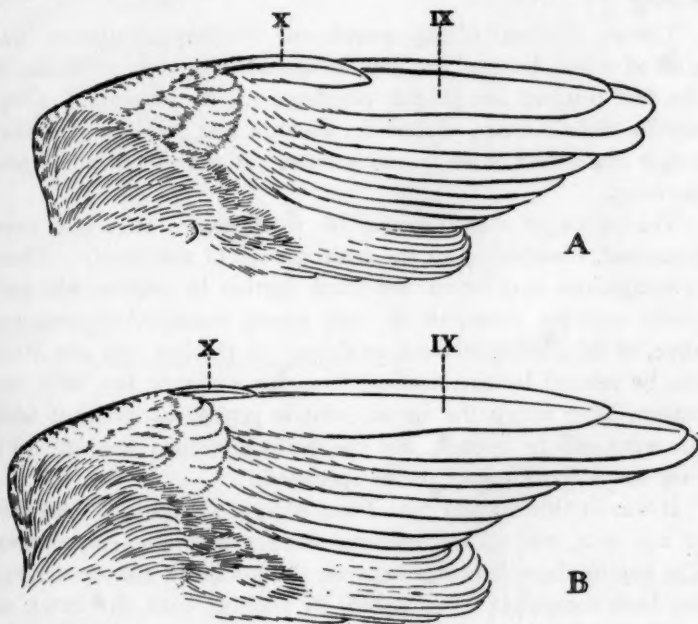


Fig. 3. *Sphyrapicus v. varius*. Wing of (A) young (B) adult from below showing large size of the 10th (outermost) primary (X), in the juvenal plumage $\times \frac{3}{4}$

of arrested development. Among the Sapsuckers the post-juvenal molt of the primaries takes place very early, as in most other young Woodpeckers, but the juvenal body plumage is retained for an unusually long period, much of it until the following spring, as in the Red-headed Woodpecker.

Still another exception was disclosed by *Leuconerpes candidus*, a South American form apparently allied to *Melanerpes*. The

condition of the inner primaries, when the wings of the young bird are almost full-grown, is essentially the same as in *Sphyrapicus*, with no loss of length in either first or second primaries. The first is a little narrower than in the adult condition, but that is all.

A third genus of woodpeckers showing no shortening of the juvenal primaries is represented by Lewis's Woodpecker. Even the innermost grows out to adult proportions, without any narrowing.

Toward the end of my search one Neotropical species was studied which bridges the gap, it appears, between reduction of the first primary and its full development, in the young. *Chrysopytilos melanolaemus*, of Bolivia, shows a first primary somewhat longer than that of *Mesopicos goertae*, yet not of full adult proportions.

The young of thirty species of woodpeckers have now been examined, illustrating all the main groups of the family. These investigations may be carried much further by anyone who possesses suitable examples of very young woodpeckers, whether alive, or as spirit-specimens, or skins. In the last case the wings can be relaxed by surrounding them for a day or two with wet cotton, after which the carpal joint is gently manipulated until the wing can be opened, and the quills examined not only with ease but without injury to the specimen.

It was in this manner that I was obliged to secure a large part of my data, and of the material for the accompanying figures. The gap in these drawings between the primaries and secondaries has been somewhat accentuated, by pushing back the latter, so as to show clearly the feathers under discussion. And for the same reason, in all views from above, the lower coverts, since they show no unusual features, have been ignored. A more exact and detailed statement of facts may here be added for future investigators.

Ceophloeus lineatus similis (Lesson)

Fig. 4 C is taken from a rather young nestling, A. M. N. H., No. 81336, Xicotencatl, Tamaulipas, Mexico. All the longer primaries are still growing; length of wing 111 mm., whereas the adult wing measures 185 mm. The two reduced inner primaries have already reached their

full development, I measuring 35 mm. (adult size 123 mm.), and II, length 52 mm. (adult length 130 mm.).

Dryobates major pinetorum (Brehm).

Fig. 5 C shows the wing of a nestling (♀ ?) from Dept. Cote-d'Or,

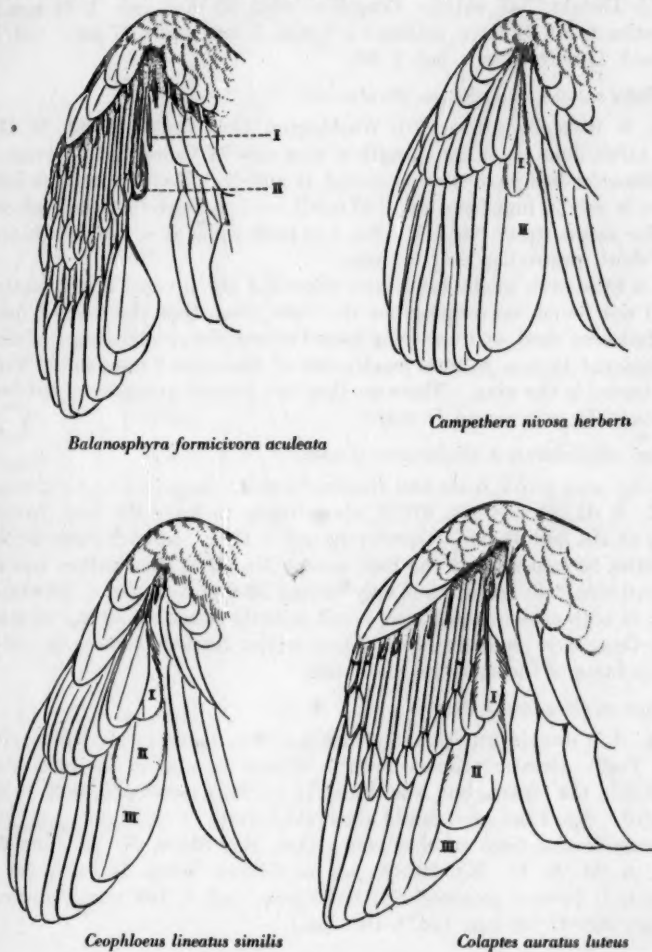


Fig. 4. Wings of nestling woodpeckers from above $\times \frac{3}{4}$.

France, A. M. N. H., No. 150932. Long primaries still sheathed at bases, length of wing 98 mm. (ad. length 130 mm.). No. I still entirely enclosed

in sheath, evidently not full-grown, measuring but 13 mm. (ad. l. 81 mm.); but No. II is fully grown, only 35 mm. long (ad. l. 86 mm.).

Dryobates villosus villosus (Linnaeus).

A rather large nestling examined, from Mastic, N. Y., July 8, 1916, coll. J. Dwight, No. 44165. Length of wing 80 mm. (ad. l. 81 mm.). Primaries I and II have attained full size, I measuring 17 mm. (ad. l. 81 mm.), II only 24 mm. (ad. l. 83).

Dryobates pubescens medianus (Swainson).

Fig. 5 B from nestling (♀), Washington Co., Maine, A. M. N. H., No. 113788, June 14, 1878. Length of wing only 71.5 mm. (ad. l. 94 mm.). All primaries still have sheaths except II and X. No. II, although full-grown, is only 22 mm. long (ad. l. 63 mm.), but has much the same pattern of color as the tip of No. III. No. I in both wings is in the sheath and very short, protruding only 3.5 mm.

This little stub might have been taken for the juvenal first primary, had I not found, on opening out the right wing, that the juvenal quill had just been shed, and was lying loose between the neighboring feathers. It measured 18 mm. in total length, but of this some 3 mm. would have been buried in the wing. There are thus two juvenal primaries of reduced size, as in *D. villosus* and *D. major*.

Xenopicus albolarvatus albolarvatus (Cassin).

Two young birds, male and female, from El Dorado Co., California, A. M. N. H. Nos. 87314, 87322, about ready to leave the nest, having wings of 104 and 97 mm. respectively (ad. l. 127). In both cases all the primaries had sheaths at the base except No. II. This feather was of reduced size, fully grown, but only 44 and 39 mm. long (ad. l. 80 mm.). No. I in both cases was still very small, entirely sheathed, 19 and 10 mm. long; these were undoubtedly the first winter feathers coming in, after the shedding of the small juvenal quills.

Colaptes auratus luteus Bangs.

Fig. 4 D was drawn from a young nestling, taken in the vicinity of New York. Greater primary-coverts, as well as most of the primaries, are still in the sheath, but Nos. I and II are fully developed, both being dwarfed. No. I has been raised above its covert.

Measurements from another young bird, Bay Shore, N. Y., June 29, 1909, A. M. N. H., No. 103896, are as follows: Wing, 101 mm. (ad. l. 156 mm.); juvenal primary No. I, 26 mm. (ad. l. 102 mm.); juvenal primary No. II, 40 mm. (ad. l. 107 mm.).

Picus viridis viridis Linnaeus.

Fig. 2 B, of a young female from Renthendorf, Saxony, A. M. N. H., No. 571. Wing not quite fully grown, length 120 mm. (ad. l. 160). The

two inner primaries fully developed, but conspicuously shortened; No. I measuring 38 mm. (ad. l. 102), No. II, 52 mm. (ad. l. 106 mm.). No. I has been raised above its covert so as to bring it into view.

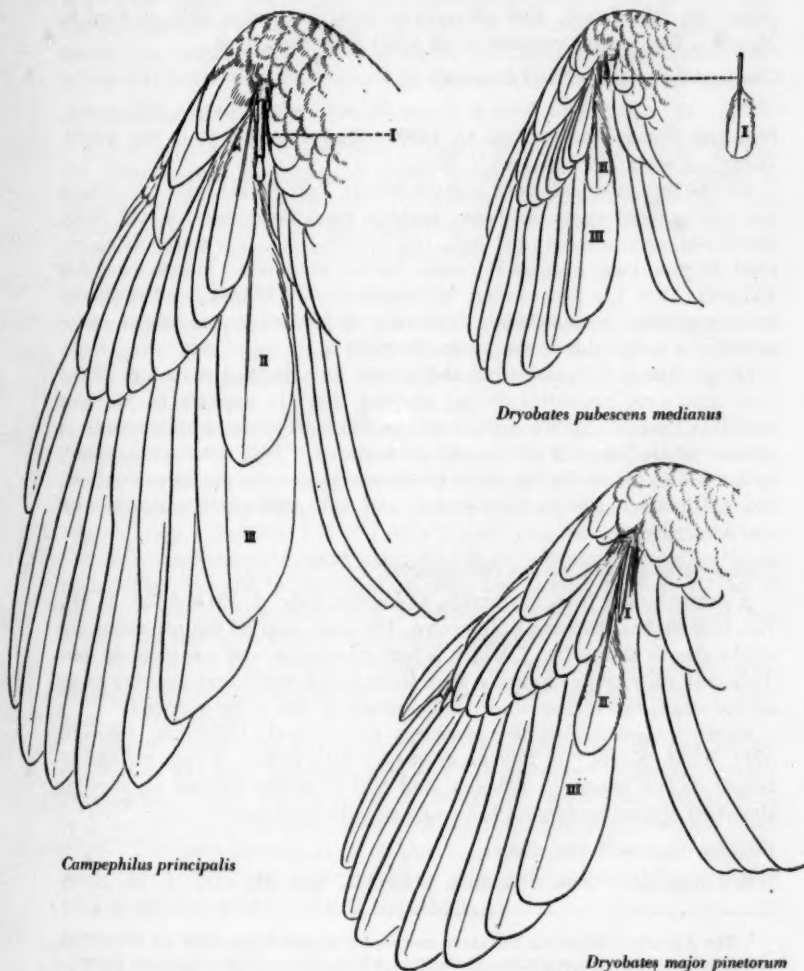


Fig. 5. Wings of nestling woodpeckers from above (A) $\times \frac{1}{2}$, (B. & C.) $\times \frac{3}{4}$.

Balanosphyra formicivora aculeata (Mearns).

Fig. 4 A is from a half-grown nestling (♀), Pinal Co., Arizona, July

30, 1884, A. M. N. H., No. 29464. The length of wing is only 72 mm., as against 139 mm. for the adult. There are clearly two dwarf primaries, for although No. I is still entirely enclosed in the sheath, No. II has attained its full growth, with calamus at base, measuring only 18 mm. in length. The second primary in an adult is 85 mm. long.

Campephilus principalis (Linnaeus).

Fig. 5A was drawn from a young ♀, with wings nearly full-grown, from Old Town, Florida, Apr. 15, 1892. Wm. Brewster Coll. No. 42972. Length of wing 210 mm. (ad. l. 254).

All the primaries still have sheaths except Nos. II, III, and X. There are two reduced inner primaries, perhaps even three, for No. III, fully developed, measures only 131 mm. (ad. l. 170). No. II is markedly shortened, 91 mm. long, whereas the same feather in an adult female measures 155 mm. No. I is just coming in, measures only 19 mm., and is almost entirely covered by its sheath. In view of its late appearance it seems doubtful whether this is the juvenal feather.

In any event it is clear that there must be a marked reduction of the two innermost primaries during nestling life. It appears to be very probable that a slight reduction of No. III is of common occurrence in species where I and II are greatly abbreviated. This is not always easy to determine, for at the age where the shortest primaries are best examined, No. III is apt not to be fully grown, and thus difficult to compare with the adult size.

Campephilus pollens pollens (Bonaparte).

A young female from La Florida, Colombia, July 11, 1911, A. M. N. H., No. 109580, has the wing fully grown, 174 mm., and all the primaries out of the sheath except No. I, which is just growing in, and measures 48 mm. This may or may not indicate that there was a small first primary at an earlier stage, but it does show that primary II was never reduced.¹

Another specimen of the same sex (♀), Cocal, Colombia, June 10, 1911, A. M. N. H., No. 109586, must be a little older. Primary I has attained its full length of 126 mm. and No. II is just coming in, showing that this species undergoes the usual post-juvenal molt.

Campephilus malherbei Gray.

A young male, from Noanamá, Colombia, Dec. 31, 1911, A. M. N. H.

¹ The American Museum has since received a younger specimen of *C. pollens*, apparently a male, from Cauca, Colombia, which shows the first juvenal primary in place. Its wing measures 161 mm. (ad. l. 174), and the longest primaries are practically complete. There is considerable reduction of the first primary, for it is 34 mm. shorter than the adjoining first secondary, and although fully grown, measures but 96 mm. as compared with 135 in an adult (a shortening of nearly one third), the second juvenal primary is only very slightly reduced, 113 mm. (ad. l. 140) and the third primary hardly at all.

No. 111840 has all the primaries full grown except I. Length of wing, 170 mm. Primary II of the juvenal plumage is not reduced in size; it would appear that the primary I now growing in (60 mm. long) is that of the "first winter" plumage. This assumption seems justified, because the first primary of the juvenal plumage is generally completely grown before the longer quills of the same series. Whether the juvenal first primary is reduced or not cannot be demonstrated.

Campephilus haematogaster (Tschudi).

A young female, from Zamora, Ecuador, Nov. 1, 1913, A. M. N. H., No. 129623, has its wings full grown (length 185 mm.), but primary I, though well grown, still retains a basal sheath, and is certainly the "first winter" quill. What the first juvenal quill was like we cannot say, but certainly No. II of the juvenal series is not reduced.

Melanerpes erythrocephalus (Linnaeus).

Three young specimens were examined, with wings so short that they must have been taken from the nest. In each case primary No. I was small, and in the sheath, but we can be almost sure it is not the juvenal quill.

The youngest in the American Museum, No. 61231, Custer Co., South Dakota, July 10, 1893, has the wing about 108 mm. (ad. l. 140 mm.). None of its primaries except the outermost (X) is full-grown, all the others have sheaths at the base, and No. II is not appreciably reduced, already 70 mm. long. Yet No. I is still only 5 mm. long, entirely enclosed in a sheath. Conditions are exactly the same in both wings. There is a great probability that the juvenal first primary has already been shed, but in no other species examined save *Centurus carolinus* and *Dryobates pubescens* has this been seen to take place so early.

Two young in Dr. Dwight's collection, with wings of 97 and 104 mm. in length, likewise show, the first primaries in their sheaths, 12 and 18 mm. long. (See Fig. 6B.)

Another young bird in the American Museum (Aug. 20) has the renewed first primary, presumably of the "first winter" plumage, already growing in. Other young taken in September show that primaries II to X are not molted at once, since I can be distinguished by its fresh black color. The post-juvenal molt of the wing-quills, in this species, takes place only toward December, so there is no close sequence between the molt of the first primary and of the others.

Centurus carolinus (Linnaeus).

Two young birds (♂), with longest primaries not quite full-grown, taken at Seven Oaks, Fla., May 20 and 22, 1912, coll. J. Dwight, Nos. 32099, 32100. In both cases the length of wing was 110 mm. (ad. l. 131 mm.). Primaries II and III were full-grown, and about of adult length,

but in both birds I was a small feather, 9 and 17 mm. long, entirely enclosed in the sheath. This is exactly like the condition in *Melanerpes erythrocephalus*, and I was unable to say whether or not the juvenal feather has already been shed until I examined a much younger bird, a female, about one-half grown, in the Museum of Comparative Zoology, No. 43447. Its wing measured 62.5 mm., and all the primaries were still sheathed at their base, even No. I. The latter was therefore not quite fully grown, but measured 24 mm., and was of soft texture, and much narrowed, only 4.5 mm. wide at its broadest part. Here then was the reduced juvenal primary we sought. No. II showed no sign either of narrowing or of shortening.

Centurus striatus (Müller).

A young female from Sanchez, Santo Domingo, March 3, 1907, A. M. N. H. No. 102072, had the wing 110 mm. long (ad. l. 117 mm.), and yet had not been long out of the nest. The innermost primary is just coming in, and already 66.5 mm. long, while the second measures 77 mm. There is no reduction of No. II; but it seems practically certain that No. I is now the first-winter feather, its juvenal predecessor being early lost, as in *Centurus carolinus*.

Hypoxanthus rivolii brevirostris Tacz.

One young bird, about two-thirds grown, from Southern Ecuador, in A. M. N. H. Its wing measures 93 mm. (ad. l. 132 mm.); all primaries are still in the sheath except No. I which is full grown, but only 38 mm. long, whereas No. II has already reached a length of 66 mm. and is still growing. The latter is clearly not reduced in size.

Campethera permista (Reichenow).

Fig. 6D from a nestling (♂), Medje, Ituri District, Belgian Congo A. M. N. H. No. 159466. All the longer primaries still have sheaths at the base; length of wing 80 mm. (ad. l. 96 mm.). Primary II not shortened but No. I extremely reduced, its full length only 18 mm. (ad. l. 71 mm.). Yet the greater upper covert of No. I is of normal size.

Campethera nivosa herberti (Alexander).

Fig. 4B taken from nestling (♀). Medje, Belgian Congo, A. M. N. H. No. 159500. Larger primaries still growing, length of wing 66 mm. (ad. l. 83 mm.). The first primary, which has reached its full length, is the only one of reduced size; it measures 25 mm. (ad. l. 63 mm.).

Chrysopicos punctatus balius* (Heuglin).

Fig. 6C is drawn from a nestling in spirit, taken at Faradje, Upper Uele District, Belgian Congo. Length of wing, 78 mm. (ad. l. 107 mm.). Second primary not appreciably shortened, but first only 27 mm. long, though fully grown (ad. l. 74 mm.).

* This genus is recognized upon the advice of Mr. W. DeW. Miller.

The same reduction of the innermost primary is seen in every one of a series of six nestlings of both sexes, the greatest length attained being 35 mm., or less than one-half the adult size.

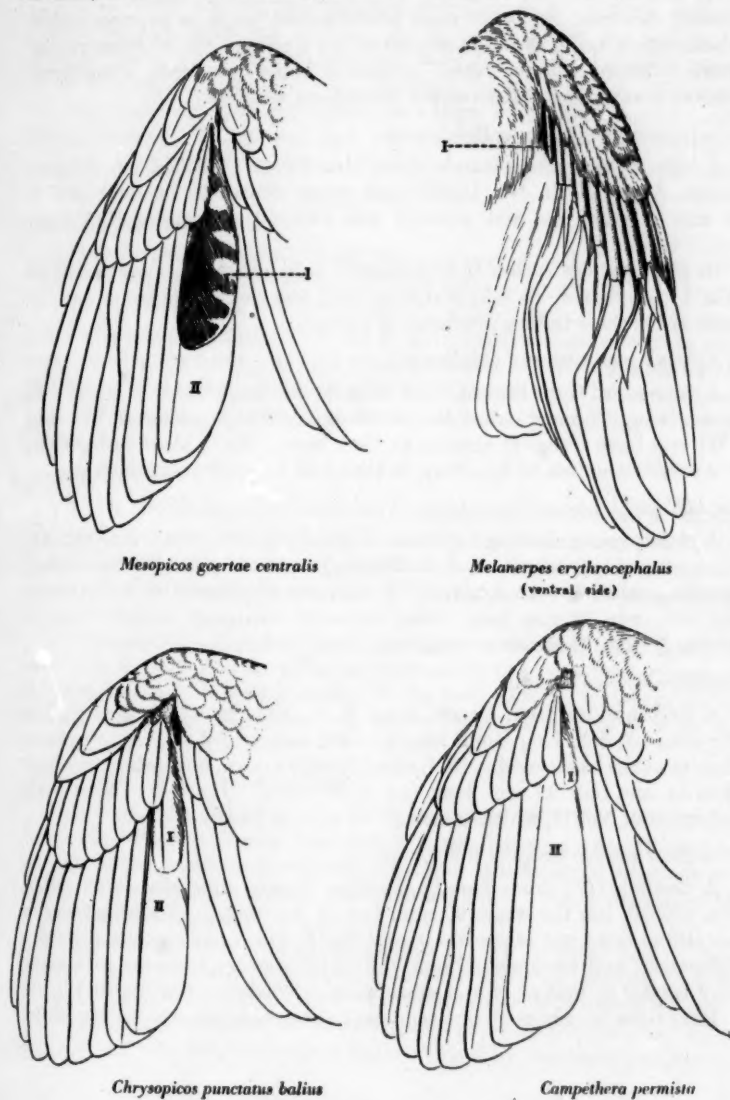


Fig. 6. Wings of nestling woodpeckers. $\times \frac{3}{4}$.

It will be seen from the drawing of this species that the carpal remex is completely wanting, as it is also in *Campethera permista*, *C. nivosa herberti*, and *Leuconerpes candidus*. A vestigial, downy carpal remex is present, however, in *Dendropicos poecilolaemus*, as it is in most other Woodpeckers, being shown in several of the drawings, viz. of *Picus viridis viridis*, *Colaptes auratus luteus*, *Dryobates major pinetorum*, *Ceophloeus lineatus similis*, and *Balanosphyra formicivora aculeata*.

Dendropicos poecilolaemus Reichenow.

A fully fledged young female, from Aba, Upper Uele District, Belgian Congo, A. M. N. H. No. 159512, had wings measuring 74 mm. (ad. l. 83 mm.). Only the first primary was dwarfed, measuring 20.5 mm. (ad. l. 60 mm.).

Its color pattern is seen to be distinctly unlike that of an adult feather (Fig. 1); and it may be said that in general, the greater the reduction the more apt is there to be a difference of pattern.

Meiglyptes grammithorax (Malherbe).

A young bird from Borneo, U. S. Nat. Mus., No. 182835, is nearly full grown, wing 77 mm. (adult length 90 mm.). Only primaries VII and VIII still have traces of sheaths at their base. No. I alone is reduced, it is narrow and just 30 mm. long, in the adult it would measure 65 mm.

Xiphidiopicus percussus percussus (Temminck).

A rather young nestling (♂) from Cuba, U. S. Nat. Mus. No. 172584, has a wing of only 65 mm. (ad. l. 120 mm.). All the primaries have basal sheaths, including even No. I, which is, however, nearing its full growth, and still only 29 mm. long, being distinctly narrowed, besides. (ad. l. 90 mm.). No. II shows no reduction, either in length or in width.

Tiga javanensis (Ljung).

A large nestling from Depok, Java, U. S. Nat. Mus. No. 219317, has the wing 106 mm. long (adult length = 138 mm.). All its primaries have sheaths at the bases except No. I, which is fully grown, but rather narrower than II, and only 47 mm. long (ad. l. 97 mm.). There is evidently no reduction of No. II, which is already 67 mm. in length.

Mesopicos goertae centralis Reichenow.

A nestling (♂) from Faradje, Belgian Congo, Am. Mus. Nat. Hist. No. 159530, has the wings 90 mm. (ad. l. 110 mm.). All its primaries are still growing out of sheaths except No. I, which has completed its development, and measures 43 mm. (ad. l. 75 mm.). Its color pattern is very similar to that of II and other inner primaries. (See Fig. 6 A.)

Here there is only moderate reduction of but one primary, so the char-

acter is intermediate between conditions in *Chrysopicos* and in a form like *Leuconerpes* showing no reduction.

Chrysophilus melanolaemus (Malherbe).

A rather large nestling was examined from Pulque, Prov. Sucre, Bolivia, Am. Mus. Nat. Hist. No. 139154. All primaries still in the sheath, including No. I, which though narrower than No. II and evidently somewhat stunted, is already 67 mm. in length (adult length = 107 mm.). There is thus only a slight reduction of a single inner primary, and a condition intermediate between that in *Mesopicos goertae*, for example, and in *Leuconerpes candidus*. This is confirmed by a second specimen from the same brood.

Leuconerpes candidus (Otto).

A well-developed nestling, from Matto Grosso, Brazil, Am. Mus. Nat. Hist., No. 34293, shows very clearly that there is no reduction in length of the inner primaries. Only primary X is full grown; the others have still a slight basal sheath, yet I and II have nearly the same relative proportions as in the adult. Length of wing 131 mm. (adult length 162 mm.); primary I, 79 mm. long (adult length 94 mm.); primary II, 86 mm. (adult length 100 mm.). The inner primaries are somewhat narrower than in the adult.

Asyndesmus lewisi Riley.

A young female from La Plata Co., Colorado, July 8, 1892, in A. M. N. H. has the wing 150 mm. long (ad. l. 169 mm.). All the primaries except X still have sheaths at the base, but there is no shortening or narrowing of any of the inner primaries. No. I already measures 92 mm. and is still growing.

Another young bird from British Columbia has the wing full grown, 164 mm., but there is no sign either of reduction of the inner primaries or of a beginning of post-juvenal molt. So the juvenal inner primaries are of full size as in the Sapsuckers, to which Lewis's Woodpecker is by no means closely related.

Sphyrapicus varius varius Linnaeus.

A nestling from Delaware Co., N. Y., Am. Mus. Nat. Hist., No. 65251, with wing already 88 mm. long (adult length 124 mm.) has all its primaries except X still in the sheath, yet I and II bear about the same relation to their fellows as they would in the adult. No. I is already 58 mm. long (adult length 70 mm.).

In this specimen, as well as in nestlings of *S. v. nuchalis* and *S. thyroideus*, there seems to be something peculiar about the growing base of primary VI of the juvenal series. Its tube or sheath is noticeably slenderer than those adjoining on each side, and appears to break away more quickly, yet the fully developed feather shows no resultant peculiarity.

This is the single quill that grows on the phalanx of the third digit of the manus. No such peculiarity was noted in any other woodpecker, not even *Leuconerpes*.

Sphyrapicus varius nuchalis Baird.

A nestling from Boulder Co., Col., U. S. Nat. Mus., No. 84310, with primaries still in the sheath, shows large first and second primaries.

Sphyrapicus ruber ruber (Gmelin).

A nestling (♂) from Fort Klamath, Ore., July 14, U. S. Nat. Mus. No. 558, shows no reduction of primaries I and II.

Sphyrapicus thyroideus (Cassin).

Two nestlings from Colorado (♂ and ♀), U. S. Nat. Mus., Nos. 84321 and 84322 have wings 78 and 84 mm. long (adult length 136 mm.) respectively. Both have primary I well developed, and about as long as No. II, agreeing thus with the young of *S. varius*.

PROBABLE SIGNIFICANCE.

Having demonstrated the frequency and diversity of this unusual character among nestling woodpeckers, let us consider its possible interpretation. Does it repeat any previous stage in evolutionary development? Probably not. It seems beyond question that the woodpeckers have originated from a line of descent more like the barbets than any other living group, and the Capitonidae show no reduction of the inner primaries either in the adult or in the young, certainly not in the several genera, *Hellobucco*, *Tricholaema*, *Buccanodon*, and *Lybius*, which I have carefully examined. Furthermore, reduction in the size or number of primaries, in all the higher groups of birds, seems to have taken place at the distal, not the proximal end of the primary series.

A clear case of "recapitulation," for example, may be seen in the 10th (outermost) primary of many Picidae, which is conspicuously longer in the juvenal plumage than it is in the adult. Perhaps the best illustration—pointed out to me by Mr. W. DeW. Miller—is offered by the sapsuckers (*Sphyrapicus*), where the wing-tip is exceptionally long and pointed, and the 10th primary of the adult unusually small. In the first plumage the corresponding feather is approximately 66 per cent. longer, as well as much wider, than in the parents' wing. (See fig. 3.) This indi-

cates that the quill in question was better developed in the ancestral forms, and supports the prevailing view that the number of primaries, and the size of the outer one, have undergone reduction in the Passeres, Pici, and other specialized groups of birds.

So far as we know, then, or can surmise, the diminished size of the young woodpeckers' inner primaries does not represent any earlier stage in the ancestral history of this extremely specialized family. We are more inclined to look upon this condition as fitting the young woodpecker for some nest-dwelling exigency, and comparable, in a way, to the rasp-like heel-pad of young barbets and toucans, which likewise disappears before adult life. But why, it might be asked, do not other young birds reared in cavities of trees possess this same character? I can only answer that the Picidae exhibit a number of striking adaptations to a life spent climbing upon the bark of trees, such as their chisel beak, resistant skull, barbed, extensile tongue, and stiffened, pointed rectrices, which are wanting, in part at least, among all the other groups of birds that have adopted similar modes of life, namely the Dendrocolaptidae, Sittidae, and Certhiidae. This is only one more case where the Picidae lead.

For a while we were unable to suggest any need or advantage for a gap in the wing-feathering at the carpus, especially as the first secondary is in no wise affected by this circumstance.

The shortening of these primaries is of course effected by the premature arresting of the growth of the feather, the dwindling of the barbs and the formation of a normal calamus or barrel. This is exactly the same process that determines the length of any ordinary contour-feather, and what the immediate causes are seems not very readily explained. They may be concerned with blood supply, and histological study of the normal feather papilla as compared with those of powder-down feathers, or of the plumes of Japanese long-tailed fowls, might reveal something. This is a matter of considerable interest, in view of the extreme accuracy with which it is timed, so as to allow of little variability in a primary-formula, for example, or of wing-length which is a universally accepted standard for any given species, and which usually gives a real scientific basis for the so-called "millimeter race."

In this particular case of the young woodpecker, it might be ascribed to imperfect nutrition of this region of the wing, but it is only one or two quills that are affected, whereas the adjoining coverts would be expected to share in this starvation. It was felt that such an exceptional condition would hardly have been perpetuated unless some selective value could be attributed to it.

A hypothesis offered by Mr. J. T. Nichols, when he heard of these facts, is of decided interest. A gap in the wing, he argued, would allow the young birds with less difficulty to stick up their heads to be fed, in the cramped quarters of the woodpecker nest.

To be sure, should such a condition arise, it would not immediately benefit the bird possessing it so much as its nestmates, consequently this might make an explanation less plausible on the basis of natural selection. On the other hand were the parents bearers of a hereditary factor that would bring out the wing character in all their young, we might assume that all the nestlings would benefit by a more equable share of the food, thus assuring a more numerous progeny.

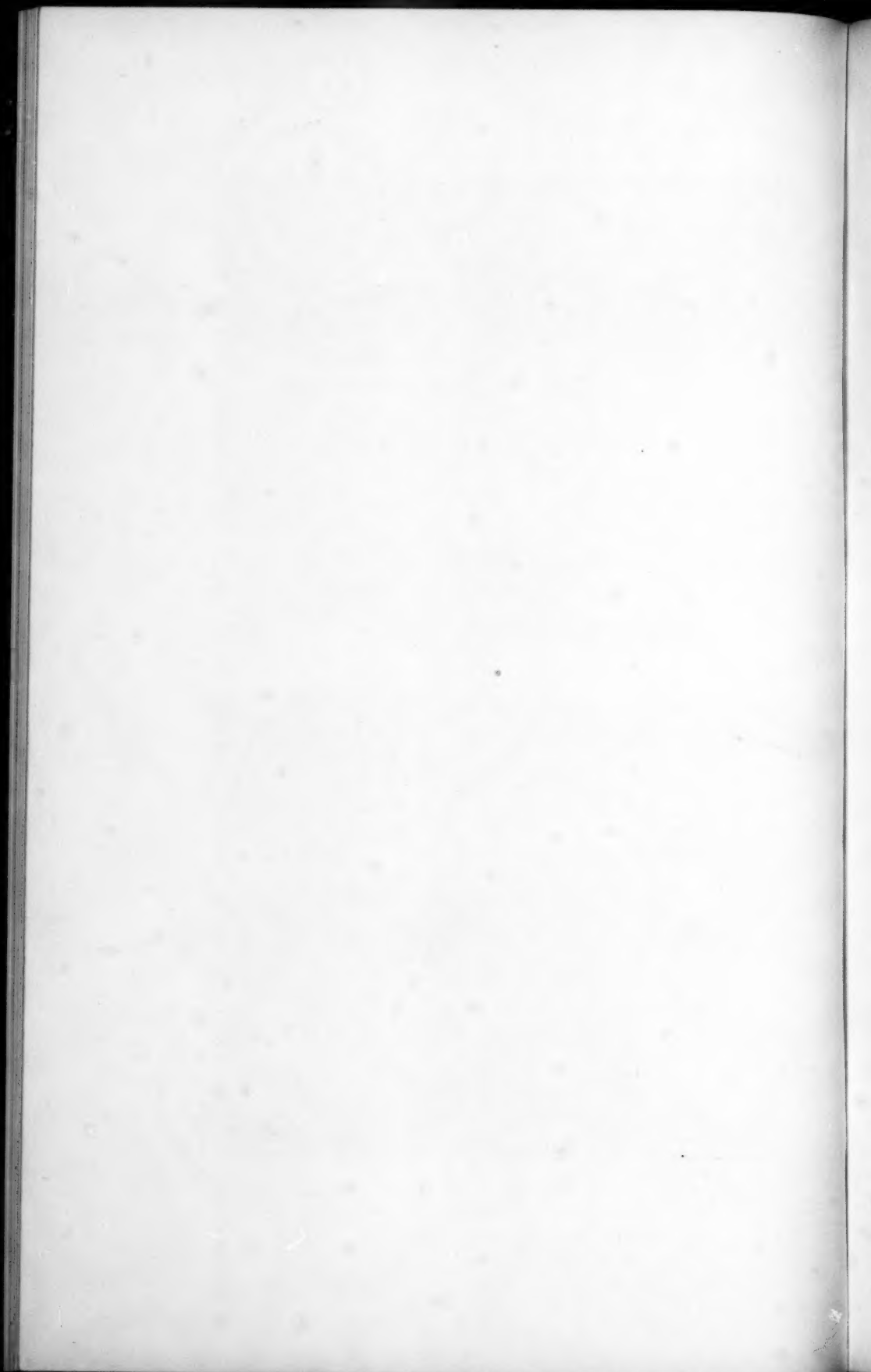
Whatever the explanation, Mr. Nichols pointed out to me that there is already direct photographic evidence supporting this theory in a motion-picture taken by Dr. T. S. Roberts and Mr. Jenness Richardson of the University of Minnesota, which was exhibited at the meeting of the American Ornithologists' Union in 1916. This film shows the young flickers being fed at the entrance to their nest. The old bird is clinging to the bark outside; two young birds are leaning well out of the opening, begging for food. One of them has a wing out of the hole, and very much in the way of its companion's open beak. The difficulty is speedily overcome by nestling No. 2, which pokes its head and neck through the wing just between the primaries and secondaries, right at the gap under discussion; and they hold this position for some little time. This is clearly shown by Plate XIX, which is taken from this instructive and timely film.

Why young sapsuckers should differ from the majority of young Picidae is a question I cannot answer for the present, but gladly leave to the curiosity of field ornithologists. They cannot fail to find here an inviting point for elucidation; indeed the young of any of the woodpeckers will be well worth careful observation.



YOUNG FLICKERS AT NEST HOLE: HEAD OF ONE PROJECTING THROUGH
WING OF ANOTHER.

From photos supplied by Zool. Mus., Univ. of Minn.



The systematic ornithologist, on the other hand, will be anxious to see what use can be made of this new character in arranging the lesser groups within the family of woodpeckers. It is not common to the whole of the Picidae, and might lead us therefore to segregate the sapsuckers, as Dr. Coues once did, in a separate



Fig. 7. Key to plate XIX. fig 2: P. primaries, S. secondaries of young bird No. 1.

subfamily. Yet in almost all their external characters the species of *Sphyrapicus* are close to *Dryobates*, with which they have recently been placed by Mr. Ridgway in the same super-generic association.* Moreover there are other genera, like *Asyndesmus*, *Leuconerpes* and *Chrysomitris*, showing no very small inner primaries, and yet utterly unlike *Sphyrapicus* in other structural characteristics. It would seem then that large-sized inner primaries, among young woodpeckers, rather than constituting a primitive heritage, were re-acquired, secondarily and perhaps.

* *Birds of North and Middle America*, VI, 1914, p. 10.

independently, by members of several different groups. This would detract greatly from the usefulness of such a feature for purposes of classification.

It is possible, nevertheless, that the number of primaries reduced, whether two or only one, may indicate an affinity between various species or even genera. At all events, in spite of the very evident adaptive nature of such a character, it is one additional point to be considered in the weighing of relationships.

At least two very different species of *Campethera*, and one each of *Chrysopicos*, *Dendropicos*, *Mesopicos*, *Tiga*, *Meiglyptes*, one of *Hypoxanthus* and *Xiphidiopicus* agree in having but a single inner primary reduced; whereas the Green, the Downy, the Hairy, the Great Spotted, the White-headed, and Mearns' Woodpeckers, the Flicker, and a Mexican Pileated Woodpecker agree in the presence of two such stunted feathers. Yet the Red-headed and Red-bellied Woodpeckers, which are often considered as congeneric with Mearns' Woodpecker, are found to have but a single small feather, at most. And so two other genera, *Asyndesmus* and *Leuconerpes*, likewise believed to be nearly related to *Melanerpes*, agree with *Sphyrapicus* in the well-developed first and second primaries of their young.

It is probable that within the *Dryocopus* group some of the genera will show one small primary, others two, as in *Ceophloeus lineatus*. The same thing has already been established for the "Ivory-bill" group (*Campephileae* of Ridgway) where *Campephilus principalis* shows two, and three other species of doubtful generic distinctness not more than one.

I may state that Mr. W. DeW. Miller, who has recently been making a very thorough investigation of the supergeneric groups of woodpeckers, and has given me every assistance in the preparation of this paper, cannot find any correlation between the present character and the important structural features which mark them otherwise. He is of the opinion that the piculets form a distinct family from the typical woodpeckers, and thus far we have been unable to discover in the Picumnidae any evidence

either of a post-juvenal molt or of juvenile reduction of an inner primary.

The majority of the species which we have shown to possess but a single dwarfed primary will be seen to have a more or less tropical distribution, while those with two are in general of more northern climes. Whether this is a general rule we cannot say as yet; in any case it appears to possess little significance, since *Sphyrapicus*, with no reduction, is a distinctly northern group, at least with regard to its breeding range.

SUMMARY.

In many different genera of woodpeckers, the first, or the first and second (inner) primaries of the juvenal plumage attain but a fraction of the normal size in the adult. They are, however, quickly replaced, at the very beginning of the early post-juvenal molt so characteristic of the Picidae, by quills not differing greatly in length from the adjacent primaries and secondaries. Even where the post-juvenal molt is delayed, the reduced primary is rapidly shed and renewed. No difference could be discovered between the sexes with regard to the size or molt of these feathers. The genera *Sphyrapicus*, *Asyndesmus*, and *Leuconerpes* and possibly others, offer an exception to the rule, having no dwarfed inner primaries. The condition of these feathers of the nestlings, in all species thus far examined, is indicated in the following table.

Reduction of Inner Primaries in Species studied thus far.

Shortening of two	{	Ceophloeus lineatus
		Dryobates major
		Dryobates villosus
		Dryobates pubescens
		Xenopicus albolarvatus
		Colaptes auratus
		Picus viridis
		Balanosphyra formicivora
		Campephilus principalis

Shortening of one	{	Campephilus pollens
		Campephilus malherbei
		Campephilus haematogaster
		Melanerpes erythrocephalus
		Centurus carolinus
		Centurus striatus
		Hypoxanthus rivolii
		Campethera permista
		Campethera nivosa
		Chrysopicos punctatus
		Dendropicos poecilolaemus
		Meiglyptes grammithorax
Narrowing, but little shortening	{	Xiphidiopicus percussus
		Tiga javanensis
No reduction	{	Mesopicos goertae
		Chrysophilus melanolaimus
		Leuconerpes candidus
	{	Asyndesmus lewisi
		Sphyrapicus varius
		Sphyrapicus ruber
		Sphyrapicus thyroideus

The value of this character in revealing the affinities of the various groups within the family is very doubtful. It is probably an adaptation of some utility during early life in the limited space of the nesting hollow, perhaps as suggested by Mr. Nichols, enabling the young birds while being fed to raise their heads through one another's wings, there being indeed photographic grounds to uphold this theory in the case of young Flickers.

American Museum of Natural History, New York.

BREEDING BIRDS OF WARLAND, LINCOLN CO., MONTANA.

BY THOMAS D. BURLEIGH.

WARLAND lies on the Kootenai River and is but a small town which owes its existence to the saw mill of the Baird-Harper

Lumber Co. It is the only town of which I have any knowledge from which there are no roads leading elsewhere. Automobiles are unknown and if one wishes to travel, walking is the only possible way except by the Great Northern Railroad. About the town there is a little open land, but the surrounding country is, with the exception of the slashing which extends for eight miles up the Cripple Horse Creek, largely covered with timber. This, on the south slope of the mountains, is western yellow pine and, as is characteristic where this species predominates, the woods are open and comparatively free from underbrush. The north slopes are covered with Douglas fir and western larch, and here the stands are thicker and underbrush is more prevalent. The mountains about the town are comparatively low in elevation, ranging in altitude from 4500 ft. to 6000 ft.

I spent the summer of 1920 in a logging camp on the Cripple Horse Creek, which I found well situated for field work. During the week I covered the slashings about the camp and the untouched timber which lay farther up the valley. My Sundays were spent in walking to Warland and working the open country there. Cripple Horse Creek is but a small stream which during this past dry summer almost completely dried up. Where it flows into the Kootenai River the valley is wide but a few miles above the camp it gradually narrows and finally forms a steep rugged gorge.

As I reached Warland late in May, I of course missed those species which breed earlier but I was in time for the bulk of the birds which prefer June in which to rear their young, and while my list is undoubtedly far from complete it will give a fair idea of summer bird life in northwestern Montana.

Actitis macularia. SPOTTED SANDPIPER.—This was a common summer resident along the Kootenai River. The last bird for the year was seen September 7.

Oxyechus vociferus. KILLDEER. This bird breeds rarely if at all for but one was seen, June 29, feeding at the edge of a field.

Dendragapus obscurus richardsoni. RICHARDSON'S GROUSE.—A scarce breeding bird, found well up the mountain sides.

Bonasa umbellus togata. CANADA RUFFED GROUSE.—A common bird of the valleys. Accustomed as I was to the birds of the east, the lack of fear shown by this species was of never failing interest to me. When one was approached it would run along the ground for a few feet and then slow down to a walk repeating this until it tired when it would

fly into a nearby tree and "cluck" angrily. A female found with newly hatched young on July 2 proved actually pugnacious, charging directly at me as I stood watching her, feathers puffed out and tail spread, uttering a low hiss and a peculiar whine, and coming within a foot of me before turning and walking slowly off to a safe distance.

***Zenaidura macroura marginella*.** WESTERN MOURNING DOVE.—I have but one record for the occurrence of this species, one bird being seen in a slashing on June 15.

***Cathartes aura septentrionalis*.** TURKEY VULTURE.—This species was of irregular occurrence here during the summer months but it very probably breeds. The first bird was seen June 29, soaring low overhead, and one was seen as late as Sept. 10.

***Accipiter velox*.** SHARP-SHINNED HAWK.—Scarce and seen at infrequent intervals in the valley.

***Buteo borealis calurus*.** WESTERN RED-TAIL.—A common summer resident. A nest found June 17 held two half grown young and was eighty feet from the ground in a large larch well up the mountain side. It was massive and evidently had been used before, and was built of sticks with a lining of fresh sprays of Douglas fir. The well picked bones of probably a rabbit were lying at the edge of the nest.

***Falco sparverius phalaena*.** DESERT SPARROW HAWK.—A common bird in the slashings and in the open spots along the Kootenai River. One nest found July 18 with well grown young was fully a hundred and twenty feet from the ground in a cavity in the top of a large dead larch in an open slashing.

***Bubo virginianus pallescens*.** WESTERN HORNED OWL.—Near midnight on July 31 one bird called for some time from the woods at the edge of the logging camp and on August 22 one was flushed from the top of a tall slender larch in the valley.

***Ceryle alcyon alcyon*.** BELTED KINGFISHER.—A summer resident along the river. A nest found June 15 held seven well incubated eggs and was in four feet in a low bank facing the river.

***Dryobates villosus monticola*.** ROCKY MOUNTAIN HAIRY WOODPECKER.—This species proved to be very plentiful in the open slashing between Warland and the logging camp. Lumbering had undoubtedly been a big factor in causing an increase in the number of these birds here for in the untouched timber farther up the valley they were rarely seen. Two nests found June 1 held noisy young.

***Dryobates pubescens homorus*.** BATCHELDER'S WOODPECKER.—Unlike the last this species was decidedly scarce and seldom seen.

***Picoides arcticus*.** ARCTIC THREE-TOED WOODPECKER.—A fairly common bird in the open slashings. A nest was found June 7 with well grown young, nine feet from the ground in the trunk of a dead Douglas fir in the middle of a slashing.

Picoides americanus fasciatus. ALASKA THREE-TOED WOODPECKER.—While not as plentiful as the last, this species was still far from scarce and showed a like preference for the open slashings. A nest found June 12 held three slightly incubated eggs and was eight feet from the ground in the trunk of a dead but still solid larch in the middle of a slashing in the valley. The male bird was incubating and flushed easily, but was quiet and showed little concern over its nest. Another nest found the same day held small young and was five feet from the ground in the trunk of a tall slender dead larch.

Sphyrapicus varius nuchalis. RED-NAPED SAPSUCKER.—A fairly common summer resident in the open pine woods, avoiding largely the slashings. A nest was found May 31 with five fresh eggs, forty feet from the ground in the trunk of a large living larch a short distance up the mountain side. The male bird was incubating and as is usually the case with this sex it flushed easily at the first rap on the tree.

Sphyrapicus thyroideus. WILLIAMSON'S SAPSUCKER.—A very scarce summer resident. To the best of my knowledge but one pair of these birds bred about Warland. The nest when found June 12 held small young and was fifty feet from the ground in the trunk of a large living larch at the edge of a slashing in the valley. After the young had flown this species was not recorded again until September 5, when one bird was seen in the open woods well toward the top of one of the mountain ridges.

Phloeotomus pileatus abieticola. NORTHERN PILEATED WOODPECKER.—A common bird in the valley and in the scattered ravines. During the summer months few were seen but toward the middle of September this species suddenly became much in evidence and the sight of one flying by overhead or feeding on an old log at the side of the trail was a common occurrence. At this time they were also rather noisy, their loud cackle being one of the first sounds heard at dawn and the last at dusk. One thing which interested me was the ease with which I could walk up to them. At one time I came across two feeding on an old rotten log lying on the ground and I was able, with a little care, to walk up within twenty feet of them and sit down and watch them for fully half an hour. This was a feat never dreamed of in Pennsylvania where I first became acquainted with this bird.

Asyndesmus lewisi. LEWIS'S WOODPECKER.—This was a fairly common summer resident in the open slashings in the valley. Four nests were found but all were inaccessible, being in the tops of the largest rottenest stubs. The lowest was sixty feet from the ground while two were fully a hundred feet up, in stubs three feet in diameter at the base and with all the bark gone.

Colaptes cafer collaris. RED-SHAFED FLICKER.—Wherever there was any open country this bird was sure to be found. A nest found May 29 held seven well incubated eggs and was but four feet from the

ground in an old stump in the middle of an open field. Others seen later with young were higher than this, ranging from ten feet to fully eighty feet up in one case.

Chordelles virginianus hesperis. PACIFIC NIGHTHAWK.—The first birds were seen June 4, two feeding toward dusk high overhead. They soon became plentiful in the slashings in the valley and it was here that the one nest was found. On July 2 a female was flushed from two fresh eggs lying on the bare ground close to a large Douglas fir at the edge of a slashing. On September 3 one bird was seen for the last time, flying silently by overhead.

Chaetura vauxi. VAUX'S SWIFT.—I have but one record for the occurrence of this species here. On August 20 six birds were seen, flying by low overhead in the valley.

Stellula calliope. CALLIOPE HUMMINGBIRD.—This was a fairly common summer resident in the open woods in the valley. A nest found June 1 held two slightly incubated eggs and was eight feet from the ground on a small horizontal dead limb close to the trunk of an alder overhanging a small stream in a ravine. It was composed largely of soft white plant down, with a few dry pine needles at the base, and covered externally with lichens.

Tyrannus tyrannus. KINGBIRD.—Although a plentiful summer resident about the town of Libby, twenty miles west of Warland, but one pair of birds bred at Warland. The nest when found July 7 held three well incubated eggs and was sixty feet from the ground in a tall slender larch in a clearing at the edge of the town. It was built of gray plant fibres, weed stems and grasses, lined with fine grasses. The last record for the year was August 9, one bird being seen at the edge of a slashing.

Nuttallornis borealis. OLIVE-SIDED FLYCATCHER.—A fairly plentiful summer resident about slashings and clearings in the valley. The last bird for the year was seen August 10.

Myiochanes richardsoni richardsoni. WESTERN WOOD PEWEE.—A scarce summer resident in the open slashings in the valley. A nest found June 21 held three incubated eggs and was twenty feet from the ground in a horizontal crotch of a small dead and somewhat bent larch in the middle of a burnt-over slashing. It was shallow but compactly built, of gray plant fibres, grasses and strands of brown moss, lined with fine grasses and feathers. Another found July 1 with three slightly incubated eggs was twenty feet from the ground in a horizontal crotch of a dead limb of a birch at the edge of a field. It was built of gray plant fibres, strips of bark and grasses, lined with fine grasses and considerable wool, the outside being sparingly covered with lichens. A third found July 4 held three slightly incubated eggs and was twenty-five feet from the ground in a horizontal crotch of a dead and somewhat bent alder at the edge of a thicket in the middle of a slashing. Like the others it was shallow but

compactly built, of gray plant fibres, grasses, strands of brown moss and, on the outside, a very few lichens, lined with brown moss and a few grasses.

Empidonax hammondi. HAMMOND'S FLYCATCHER.—This was an abundant summer resident and was found anywhere and everywhere, in the open country about the town, in the slashings, in the open woods in the valley and well up the mountain sides. In nesting it showed no preference for any special site and the situations chosen varied widely. In all I found ten nests, as follows:

No. 1. On May 29 a bird was seen working on a nest sixty feet from the ground at the outer end of a limb of a large yellow pine at the edge of a stretch of woods. I never had the opportunity to return to it so my data for it are meager.

No. 2. A nest found June 8 held four fresh eggs and was thirty feet from the ground near the top of a slender birch at the edge of a thicket in a slashing. It was made of gray plant fibres, grasses, strands of moss and strips of bark, lined with feathers from a Hairy Woodpecker and a few horse hairs.

No. 3. June 9, four fresh eggs, thirty feet from the ground at the extreme outer end of a limb of a large larch in open woods part way up the mountain side, made of plant fibres, grasses, strips of bark, moss and a few feathers, lined with deer hair and a little horse hair.

No. 4. June 10, four fresh eggs, fifteen feet from the ground at the outer end of a lower dead limb of a lodgepole pine at the side of the stream in the valley, made of plant fibres, strips of bark, grasses, gray moss, bits of fur and a little wool, lined with several small dead leaves, bits of fur and fine porcupine hair.

No. 5. June 11, four fresh eggs, eight feet from the ground in a small Douglas fir at the edge of a thicket bordering an open field, made of plant fibres, a few grasses, moss and plant down, lined with down, a few horse hairs and, largely at the bottom, soft bud scales.

No. 6. June 13, three slightly incubated eggs, six feet from the ground in the top of a bush, in a small clump of bushes at the edge of a clearing on the mountain side, neat and compact, of gray plant fibres and grasses, lined largely with small yellow feathers and a few grasses.

No. 7. Another nest found the same day held one fresh egg and was four feet up in a small bush, in a clump of bushes growing in a crevice of a cliff fully sixty feet from the ground. It was roughly built of gray plant fibres and down and was seemingly unlined.

No. 8.—June 20, four fresh eggs, six feet from the ground in a bush on an open rocky hillside, well built of gray plant fibres, lined with soft shreds of inner bark and plant down.

No. 9. June 25, four slightly incubated eggs, twelve feet from the ground in a small Douglas fir in a thicket at the edge of a field, made of plant fibres and grasses, lined with plant down, horse hair and soft bud scales.

No. 10. July 7, three slightly incubated eggs, ten feet from the ground in a sapling in the underbrush bordering the Kootenai River, made of plantfibres, grasses and feathers, lined with horse hair and soft bud scales.

Toward the middle of August the birds began to become scarce and on September 3 the last one for the year was seen.

Pica pica hudsonia. MAGPIE.—Although this bird did not breed in the vicinity of Warland it must nest close by for, appearing toward the latter part of August, it soon became fairly plentiful and small flocks were of common occurrence.

Perisoreus canadensis capitalis. ROCKY MOUNTAIN JAY.—A fairly plentiful resident. Secretive and shy until the young were well grown. The first birds were not seen until July 21 when three were found feeding in the larger trees near the top of the mountain behind the camp. From that date on they gradually became more plentiful and by the first of September small flocks were seen almost daily.

Corvus corax sinuatus. RAVEN.—This bird was a fairly plentiful resident and there were few days when one or two were not seen. They showed little fear of man and fed indiscriminately about the town and at the edge of the logging camp. A nest which had seemingly been used the past spring was found during the summer on a ledge of a cliff well up the mountain side at the edge of the Kootenai River.

Nucifraga columbiana. CLARK'S NUTCRACKER.—It was August 9 before I saw my first one of this species but once they began to come out of their retirement it was not long until they were quite common. They showed no hesitation in coming down into the valleys and small flocks were frequently seen in the open slashings between the camp and Warland.

Molothrus ater ater. COWBIRD.—Although scarce about Warland and seldom seen there, this bird was very plentiful in and about the town of Libby, some twenty miles farther west.

Sturnella neglecta. WESTERN MEADOWLARK.—Like the last this species was scarce about Warland, due in this case to the lack of open fields, but was very plentiful about Libby.

Euphagus cyanocephalus. BREWER'S BLACKBIRD.—This species was not seen at Warland but at Libby a small colony was found nesting in an open field. Of several nests found May 29 all were being built but one and this held four fresh eggs. It was in a thick clump of low bushes at the side of a stump, within a foot of the ground, and was compactly built of small twigs, weed stems and rootlets, lined with horse hair. On returning to this place on June 8, a nest previously being built was found to hold six slightly incubated eggs. It was on the ground in a clump of small bushes and against the side of an old weathered stump, and was made of twigs, weed stems, grasses and mud, lined with horse hair.

Carpodacus cassinii. CASSIN'S PURPLE FINCH.—This was a plenti-

ful bird not only toward the tops of the mountains but in the slashings and open woods in the valley. On my arrival in late May they were still in small flocks and evidently did not nest until the latter part of June. By the middle of September small flocks were again much in evidence about thickets and underbrush in the slashings.

***Loxia curvirostra minor*.** CROSSBILL.—On June 6 a small flock of ten birds was seen and from this date on this species gradually increased until it had become exceedingly abundant. During July and August small flocks were especially numerous and could be seen anywhere and at any time during the day, feeding in the tops of the firs or flying noisily by overhead.

***Astragalinus tristis pallidus*.** PALE GOLDFINCH.—I have but one record for the occurrence of this species here. On June 15 two birds were seen feeding in the underbrush bordering the Kootenai River.

***Spinus pinus*.** PINE SISKIN.—An abundant bird in the valley and well up the mountain sides. They had evidently finished nesting before I arrived for I invariably found them in small flocks and never singly or in pairs.

***Zonotrichia leucophrys gambeli*.** GAMBEL'S SPARROW.—This species was a scarce summer resident. I found but one pair breeding in the immediate vicinity of Warland, in the narrow stretch of deciduous underbrush bordering the Kootenai River.

***Spizella passerina arizonae*.** WESTERN CHIPPING SPARROW.—A very abundant summer resident. It showed no partiality for any given situation and nested everywhere, in the slashings, in the open woods in the valley, in thickets and underbrush well up the mountain sides, and in the open cultivated country along the river. Fresh eggs were found from the latter part of May until the last of June so evidently two broods are raised. Four eggs were the usual number laid although sets of three were not uncommon and on one occasion, June 7, I found a nest with five well incubated eggs.

***Junco hyemalis montanus*.** MONTANA JUNCO.—A common bird about open slashings and clearings in the woods. A nest found June 18 held four fresh eggs and was sunken in the ground at the top of a low bank, well concealed in the deep grass, at the side of a logging railroad and in the middle of an open slashing in the valley. It was built of grasses and strands of brown moss, lined well with fine grasses, a little deer hair and a few horse hairs. This was undoubtedly a second set for young birds out of the nest several days were seen being fed by their parents on May 31. Another nest found July 2 held three incubated eggs and was sunken flush with the ground in a clump of weeds and at the side of a large stone, in open woods at the edge of a clearing in the valley. It was large and compactly built of weed stems, grasses and strands of brown moss, lined with deer hair and, largely at the bottom, fine grasses.

Melospiza melodia montana. MOUNTAIN SONG SPARROW.—A fairly plentiful summer resident about thickets and underbrush in the slashings and in the open country about the town. A nest was found July 4 with four slightly incubated eggs, four feet from the ground in a cluster of birch shoots at the base of a dead birch in the underbrush at the edge of the Kootenai River. It was large and compactly built of rootlets, weed stems, strips of bark and grasses, lined with horse hair and fine grasses.

Zamelodia melanocephala. BLACK-HEADED GROSBK.—An adult male was seen June 15 in the underbrush bordering the Kootenai River so evidently a pair of these birds bred here but I saw them nowhere else during the entire summer.

Piranga ludoviciana. WESTERN TANAGER.—An abundant summer resident. Four nests were found, one June 4 with five slightly incubated eggs, another June 6 with four incubated eggs, a third June 22 with four well incubated eggs, and the last July 1 with four fresh eggs. These varied from twenty-five to thirty-five feet from the ground and were all at the outer end of limbs of large Douglas firs. All were alike in construction, being compactly built of fir twigs and rootlets, lined with rootlets and a few horse hairs. The female was incubating on the first nest found and would not flush and finally had to be lifted from the nest by hand.

Iridoprocne bicolor. TREE SWALLOW.—A scarce summer resident, two pairs being found in the slashing between the camp and the town, and one pair about the town itself. The nest of the latter pair, thirty-five feet from the ground in an old charred stub in an open field, was investigated on June 29 and found to hold fourteen incubated eggs. This exceeds by just five eggs the largest set of this species I had ever known to be taken. It was undoubtedly the product of this one pair of birds for no others were ever seen in the vicinity and the eggs were uniform in size and equally well incubated.

Tachycineta thalassina lepida. NORTHERN VIOLET-GREEN SWALLOW.—The only place I found this species was in the rugged gorge a few miles beyond the camp, three pairs of birds breeding in the cliffs there. The nests were in crevices well toward the tops of the cliffs and inaccessible.

Riparia riparia. BANK SWALLOW.—A small colony of six pairs of these birds was found nesting in a low bank at the side of the Kootenai River and just at the edge of the town. A nest dug out June 15 held six fresh eggs and was built of weed stems and grasses, thickly lined with white chicken feathers. The last record for the year was September 7, two birds being seen, feeding over an open field.

Stelgidopteryx serripennis. ROUGH-WINGED SWALLOW.—Several pairs of birds were found nesting with the Bank Swallows but were seen nowhere else. Two nests that were dug out on June 15 were in fully four feet and were well built of weed stems and rootlets, lined with fine

grasses. One held seven well incubated eggs and the other five but slightly incubated. The last birds for the year were seen August 10.

Bombycilla garrula. BOHEMIAN WAXWING.—While I did not actually find this species breeding here there is no doubt in my mind but that it did nest close by, in one of the more secluded valleys, for on Sept. 24 I saw three birds in a slashing within a short distance of the town. This was too early for them to have been driven in by the approach of winter farther north and I feel that had I been able to cover more territory I would possibly have found the spot where they were nesting.

Bombycilla cedrorum. CEDAR WAXWING.—A common breeding bird in the more open country, especially in the underbrush about the town and along the river. The first nest was found June 25 with four fresh eggs, in a horizontal crotch of an alder leaning well out over the river, ten feet above the water. It was built of weed stems, grasses, plant fibres and considerable brown moss, the upper part being entirely made of the last, lined, largely at the bottom, with fine dry weed stems. Another found June 29 held five incubated eggs and was five feet from the ground in a small Douglas fir in a thicket at the edge of a field. A third nest found July 4 held but two incubated eggs and was on a horizontal limb of an alder leaning well out over the river, eight feet from the water.

Vireosylva olivacea. RED-EYED VIREO.—Two singing males were seen during the summer, one in the alders along the creek in the valley and the other in the underbrush bordering the river. A slight but unsuccessful attempt was made to find the nests.

Vireosylva gilva swainsoni. WESTERN WARBLING VIREO.—A fairly plentiful summer resident, found invariably about the scattered deciduous thickets in the open pine woods on the south slopes of the mountains. A nest found June 17 held three slightly incubated eggs and was eight feet from the ground at the outer end of a limb of a maple sapling at the edge of a thicket. It was built of grasses and strands of brown moss, lined with fine grasses and a few horse hairs, the outside being more or less covered with white downy spiders' egg cases. This nest was taken and on July 1 the bird was again incubating three eggs in a nest nine feet from the ground in a maple sapling in a thicket.

Lanivireo solitarius cassinii. CASSIN'S VIREO.—A plentiful summer resident. One nest was found and this on June 6 held four slightly incubated eggs. It was twenty feet from the ground at the outer end of a limb of a small yellow pine at the edge of a clearing in the woods and was built of crushed fragments of weed stems and grasses, lined with fine grasses, the outside being sparingly covered with white downy spiders' egg cases. On September 14 the birds were still seen daily and were frequently heard singing.

Dendroica aestiva aestiva. YELLOW WARBLER.—The deciduous

underbrush along the river was the only place inhabited by this species but the birds were remarkably plentiful there. Three nests were found, within a radius of five hundred yards, one June 8 with five incubated eggs, and two June 11 each with four slightly incubated eggs. Two were in birch saplings and one in a bush and all were within five feet of the ground. The nests differed in no way from those characteristic of this species, being made of gray plant fibres and grasses, lined with plant down, feathers and a few horse hairs.

Dendroica auduboni auduboni. AUDUBON'S WARBLER.—A plentiful summer resident. A nest found June 19 held four small young and was fifteen feet from the ground at the outer end of a limb of a Douglas fir in a ravine. It was made of gray plant fibres, grasses, feathers and a little moss, lined with feathers, deer hair and a little horse hair. This nest had a tragic ending for a forest fire swept through this ravine a few days later and the young birds were burned to a crisp.

Dendroica townsendi. TOWNSEND'S WARBLER.—A fairly plentiful summer resident, being found largely in the scattered ravines. From the time of my arrival until the latter part of June I spent considerable time in attempting to locate a nest but all my efforts were unsuccessful. The males fed and sang in the tops of the largest trees and it was difficult to even get a view of one let alone trail one to a nest. My experience convinced me that the birds nested high and when I think of the size of some of those western yellow pines I am not at all sure that I could have gotten to a nest if I had found one. The song of the Townsend's Warbler is quite distinctive and unlike any other of this family that I have ever heard, and I would render it as "zee, zee, zee-slee-slick," the last two notes being abrupt and high pitched and having a certain resemblance to a note of the Chickadee. Another song less commonly heard was less distinctive, being a "zee, zee, zee, tzee, tzee," the last two notes being lower in pitch than the others.

Seiurus noveboracensis notabilis. GRINNELL'S WATER-THRUSH.—In a dense alder swamp in the valley one pair of these birds was found breeding but several mornings spent in splashing and tumbling about through the thickets and scattered pools produced no results so far as finding the nest was concerned.

Oporornis tolmiei. MACGILLIVRAY'S WARBLER.—A fairly plentiful summer resident in thickets and underbrush in the valley. A nest found June 20 held four fresh eggs and was five feet from the ground in a crotch of an alder some distance away from the nearest underbrush. It was rather bulkily built of weed stems, grasses and strips of bark, lined with horse hair. This was evidently a second brood or more probably another attempt to rear young after the first nest had been destroyed, for several days before I had seen young birds already out of the nest. August 31 the last bird for the year was seen.

Geothlypis trichas occidentalis. WESTERN YELLOW-THROAT.—

Somewhat to my surprise this bird was not found breeding here and I have but one record for its occurrence, one bird, a fall migrant, being seen Sept. 7.

Wilsonia pusilla pileolata. PILEOLATED WARBLER.—This bird bred in the open mountain meadows at a higher altitude than Warland could boast of and none were seen about the town during the summer months. One bird, a spring migrant, was seen May 29 and from Aug. 26 until Sept. 14 birds were seen at infrequent intervals in thickets and underbrush in the valley.

Setophaga ruticilla. REDSTART.—A scarce summer resident along the river, and but rarely seen during the fall migration.

Dumetella carolinensis. CATBIRD.—This bird was found only in the underbrush bordering the river but it was quite plentiful there, at least six pairs nesting within a short distance of the town.

Salpinctes obsoletus obsoletus. ROCK WREN.—On June 1, while crossing a talus slope in the rugged gorge beyond the camp I came across one of these birds feeding among the rocks, and heard it sing several times. But one pair was seemingly breeding there and I saw no others anywhere else in the vicinity.

Troglodytes aëdon parkmani. WESTERN HOUSE WREN.—A common summer resident about the town and in the slashings in the valley. A nest found June 8 held seven well incubated eggs and was under the eaves of a shed. Another found June 14 held seven fresh eggs and was on the frame above the door of, and inside, an old logging camp bunk house in a slashing in the valley. It was a mass of twigs and a few weed stems and grasses, the cavity in the top being well lined with feathers and horse hair. A third nest found July 1 was the most interesting for it was built behind a loose piece of bark on a dead larch in a slashing, five feet from the ground. In construction it differed in no way from the others, being built of twigs and grasses, lined with feathers. It held one fresh egg and later was found to be deserted. The last bird for the year was seen September 14.

Nannus hiemalis pacificus. WESTERN WINTER WREN.—A scarce summer resident in the alder thickets along the stream in the valley.

Certhia familiaris montana. ROCKY MOUNTAIN CREEPER.—Although fairly plentiful during the summer months, this bird evidently bred well towards the tops of the mountains for it was not until the latter part of June that any were seen in the valley.

Sitta carolinensis nelsoni. ROCKY MOUNTAIN NUTHATCH.—Plentiful both in the slashings and in the open pine woods. They breed early for the first nest found May 30, twenty feet from the ground in a cavity in the top of a stub, held small young.

Sitta canadensis. RED-BREASTED NUTHATCH.—This species was even more plentiful than the last and likewise nested both in the slashings

and in the open pine woods. I found quite a few nests but I was unfamiliar with the breeding habits of these birds and this lack of knowledge resulted in my data consisting entirely of nests with young. As I learned to my sorrow the birds continue to carry pitch to the entrance of the nest from the time the nest is first begun until the young have flown. For over a week I watched the birds make frequent trips carrying pitch and thought all the time that they were still building but as it turned out the females were then incubating full sets. On June 16 I found a nest containing almost fully grown young that was but two feet from the ground in an old rotten stub and during the fifteen minutes that I watched the birds they made seven trips to the nest, carrying each time not food but pitch which they carefully smeared on any wood that was exposed within several inches of the entrance. Another nest that was found was fully a hundred feet from the ground in the dead top of a larch but the average height was thirty feet.

***Sitta pygmaea pygmaea*.** PYGMY NUTHATCH.—Plentiful in the open slashings in the valley. After they had finished nesting they wandered about in quite large flocks and at this time were noisy and much in evidence.

***Penthestes atricapillus atricapillus*.** EASTERN CHICKADEE.—I have but one record for the occurrence of this species here, two birds being seen on Augtuf 26, feeding in underbrush in the valley.

***Penthestes gambeli gambeli*.** MOUNTAIN CHICKADEE.—A plentiful resident, both in the valley and well up the mountain sides. A nest found June 6 held but three incubated eggs and was thirty-five feet from the ground in a knot hole in the trunk of a large larch in the open pine woods part way up the mountain side. It was a matted well cupped bed of deer hair and soft fur. The female was incubating and flushed when the tree was rapped. Another nest found June 10 held seven slightly incubated eggs and was but a foot from the ground in a natural cavity in an old charred stump on an open hillside. The female flushed as I passed and revealed the nest which otherwise would never have been noticed. On June 12 birds were seen feeding young in a nest fully eighty feet from the ground in the trunk of a large dead larch in a burnt-over slashing so it can be seen that this species is not at all particular as to the situation in which the nest is built.

***Regulus satrapa olivacea*.** WESTERN GOLDEN-CROWNED KINGLET.—This species was a scarce summer resident and but few bred about Warland.

***Regulus calendula calendula*.** RUBY-CROWNED KINGLET.—This bird was plentiful during the summer months in the open pine woods in the valley, feeding and singing in the tops of the largest trees. An attempt was made to find at least one nest, but it proved very difficult to even see the birds and trailing one to a nest was practically impossible.

Myadestes townsendi. TOWNSEND'S SOLITAIRE.—A fairly plentiful summer resident in the valley. A nest found May 30 held four well incubated eggs and was in a crevice in the face of a cliff at the side of the creek, twelve feet from the ground and ten feet down from the top. It was bulky but flat, of weed stems, twigs and grasses, lined with fine grasses and dry pine needles.

Hylocichla ustulata swainsoni. OLIVE-BACKED THRUSH.—A very plentiful summer resident. Fresh eggs were found from June 20 to July 6 and seemingly but one brood is raised. A favorite situation for the nest was in the top of a small Douglas fir within eight or nine feet of the ground although one nest was found in a birch, another in an alder and several in bushes within four feet of the ground. In construction the nests varied little being small and compact, built of weed stems, grasses and moss, lined with fine grasses, moss, and fragments of dead leaves. September 16 the last bird for the year was seen.

Planesticus migratorius propinquus. WESTERN ROBIN.—Coming from the east it seemed strange to me to find these birds as plentiful deep in the woods as they were about the towns and in the open cultivated country. They were abundant everywhere but away from civilization they showed a marked preference for clearings or the more open woods. One thing I did notice was that they nested earlier about the towns than in the woods for at Libby on May 29 I found nests with well incubated eggs while about the logging camp the first nests found June 3 held fresh eggs. Evidently two broods are raised for fresh eggs were found as late as July 20.

Ixoreus naevius meruloides. NORTHERN VARIED THRUSH.—A scarce summer resident and found invariably in secluded ravines.

Sialia mexicana occidentalis. WESTERN BLUEBIRD.—This species was fairly plentiful in slashings and clearings in the woods. A nest found June 11 held five fresh eggs and was four feet from the ground in a cavity in an old rotten stub in the middle of a slashing. It was substantially built of grasses. Another nest found June 15 held five fresh eggs and was ten feet from the ground in a hole in the trunk of a large dead yellow pine.

Sialia currucoides. MOUNTAIN BLUEBIRD.—This species was about as plentiful as the last and was found with it in the slashings, and more commonly about the town. Two nests found May 29 both held six fresh eggs, and were within four feet of the ground in cavities in stumps. One was unusually well built of weed stems, grasses, and chicken feathers, lined with feathers and soft shreds of inner red bark.

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THE FEEDING HABITS OF THE BLACK SKIMMER.

BY STANLEY CLISBY ARTHUR.

Plates XX and XXI.

To those who have studied the sea birds no species is of more interest than the Black Skimmer (*Rynchops nigra*) principally because of the unique formation of its bill, in which the maxilla is not only capable of excessive vertical movement but is a great deal shorter than the lower mandible. With such a difference in the length of the two parts of the bill it is quite beyond contradiction that this inch and a half of excessive growth denotes some highly specialized function.

Just what is this function?

Thomas Pennant, who in 1781 gave the bird its present common name, wrote: "I call it Skimmer from the manner of its collecting its food with the lower mandible as it flies along the surface of the water."¹

This British naturalist was probably among the first to give voice in ornithological literature to the commonly accepted version that the Black Skimmer so secures its food. As Mark Catesby had already figured and described the bird (which he called a "Cut-water") it is quite possible that Pennant attributed functions of feeding from hearsay evidence and not from personal observations.

Charles Darwin said of a flock of "Scissor-beaks" he saw flying over a lake in Argentina: "I saw several of these birds, generally in small flocks, flying rapidly backwards and forwards close to the surface of the lake. They kept their bills wide open, and the lower mandible half buried in the water. Thus skimming the surface, they ploughed it in their course . . . and dexterously manage with their projecting lower mandible to plough up small fish, which are secured by the upper and shorter half of their scissor-like bills."²

¹ Gen. of Birds, p. 52.

² Voyage of the Beagle, Ch. VII.

Skimmers, according to Audubon: "spend the whole night on the wing, searching diligently for food. . . . I have seen a few of these birds glide in this manner in search of prey over a long salt-marsh bayou or inlet, following the whole of its sinuosities, now and then lower themselves to the water, pass their bill along the surface and, on seizing a prawn or small fish, instantly rise, munch and swallow it on the wing."¹

Alexander Wilson goes rather into detail in regard to the feeding habits of this bird which he calls a "Shearwater" and his observations are most interesting: "The Shearwater is formed for skimming, while on the wing, the surface of the sea for its food, which consists of small fish, shrimps, young fry, etc., whose usual haunts are near the shore and towards the surface. That the lower mandible, when dipt into and cleaving the water, might not retard the bird's way, it is thinned and sharpened like the blade of a knife; the upper mandible being at such times elevated above the water is curtailed in its length as being less necessary, but tapering gradually to a point, that, on shutting, it may offer less opposition. To prevent inconvenience from the rushing of the water, the mouth is confined to the mere opening of the gullet which, indeed, prevents mastication taking place there; but the stomach, or gizzard, to which this business is solely allotted is of uncommon hardness, strength and muscularity, far surpassing in these respects any other water bird with which I am acquainted.

"Whoever has attentively examined this curious apparatus and observed the possessor, with his ample wings, long bending neck and lower mandible, occasionally dipt into and ploughing the surface and the facility with which he procures his food, cannot but consider it a mere playful amusement, when compared with the dashing immersions of the Tern, the Gull, or the Fish-hawk, who, to the superficial observer, appear so superiorly accommodated. . . . On examining the stomachs of several of these, shot at the time, they contained numbers of small fish usually called *silver-sides*."²

¹ Ornith. Blog. IV, pp. 204-206.

² Am. Ornith., Vol 7, pp. 90-91.

The Rev. J. G. Wood, widely read because of the lavishness of the woodcuts in his works, in his text on the Skimmer quotes Rene P. Lesson, (noted for a number of his ornithological blunders) when describing the bird's feeding habits: "It [the Skimmer] does not, however, trust solely to the wide seas for its food for according to Lesson, who was an eyewitness to the scene, the bird feeds on bivalves, adroitly inserting its beak into their shells as they lie open and then banging the shell against a rock or stone so as to break the hinge and expose the inhabitant which is immediately scooped up and swallowed."¹

The careful Coues in describing the Skimmer's feeding habits is not so positive as some other writers as to the function of the elongated bill, but does help in furthering Lesson's preposterous observation that the bird pries open oysters and other bivalves with its thin and weak bill.

"They seem to feed," he says, "as they skim low over the water, with the foreparts inclined downward, the under mandible probably grazing or cutting the surface; but they are said to use their odd bill to pry open weak bivalve mollusks."²

The popular bird literature of today differs but little in describing the feeding habits of the Skimmer. Says Chapman: "Skimmers are unique both in the form of the bill and in their manner of feeding. Opening the mouth, the blade-like lower mandible is dropped just beneath the surface of the water; then, flying rapidly, they may be said to literally 'plow the main' in search of their food of small aquatic animals."³

Reed, in his popular work, claims: "They fly in compact flocks, in long sweeps over the water, feeding by dropping their long, thin mandibles beneath the surface and gathering in everything edible that comes in their path."⁴

Hornaday has this to say of the Skimmer's feeding habits: "When seeking food the Skimmer looks for calm water, and then, with most dexterous and well-balanced flight, it slowly wings its

¹ Nat. Hist. Birds, p. 753.

² Key to N. A. Birds, p. 1019.

³ Handbook Birds N. E. America, p. 172.

⁴ Bird Guide, Water Birds, p. 56.

way close down to the surface, so low that the lower mandible is actually held *in the water* while the bird is in full flight. Any small object that happens to lie on the surface is shot into the mouth, through what is really a very small opening."¹

F. H. Knowlton, in his 'Birds of the World,' says the Skimmer's peculiar bill is an obvious adaptation for securing food: "They do not dive for their food as do the Terns, nor do they pick it up while swimming, for they rarely sit upon the water; but they obtain it by skimming rapidly over the surface with the lower mandible dipped into and cleaving the surface, thus scooping it up much after the manner of whales. The thinning of the lower mandible is clearly for the purpose of reducing the friction in passing through the water, while the upper one is shortened and has become movable to keep it out of the way. The Indian Skimmer (*R. albicollis*) according to Mr. Blanford, is usually seen on broad and smooth rivers down to the tideway, not in torrents nor, so far as known, on the sea. They are usually found in the morning and evening flying, often in scattered flocks, rather slowly close to the water, now and then dipping their bills in the stream. They occasionally catch fish, but he doubts if it is their general custom, and asserts that the use of the bill is still unknown, a statement in direct conflict with that of his distinguished countryman." (Darwin quoted also as above.)²

What I have to here advance, as a contribution to the feeding habits of a bird that I have closely and carefully observed and studied for the past seven years, is in the nature of a respectful contradiction to the statements quoted above. My observations fall into two classes, viz:

1. I have *never* seen a Skimmer secure its fish food *while skimming the waters with its under mandible immersed*, as set forth by Pennant and those who have written of this bird since his time.
2. I *have* seen the Black Skimmer secure its food and collect the fish in an entirely different manner from the generally attributed mode.

¹ Am. Nat. Hist., Vol. III, p. 257.

² Birds of the World, p. 394.

Louisiana offers exceptional opportunities for the study of the gulls, terns, Skimmers and other waterbirds. Up to 1915, from what I had gleaned from text books and general bird literature, I held the belief that the Skimmer procured its food as previously described but when exploring the Louisiana bird breeding islands with Theodore Roosevelt a remark by him set me studying this particular species with more than the cursory interest I had previously bestowed upon it.

As a result of this study, after the observance of thousands of Skimmers, at rest and in flight; in summer, when the necessity of feeding young called for incessant fishing upon the part of the adults, and in the fall when the birds were either fishing in pairs or on solitary excursions, I am forced to doubt that the Skimmer secures its sustenance in the orthodox manner, and am prepared to prove that it procures its food, or at least a part of it, by an entirely different method.

Every trip of inspection that brought me in contact with the Skimmer subsequent to my discussion with Col. Roosevelt as to the reason for the unequal lengths of this bird's bill, I kept close watch on every flying and "skimming" member of this family seen. From the deck of the conservation patrol boats, on which I made most of my trips over the Louisiana waters, aided by the magnified vision binoculars gave me, I have had exceptional opportunities for studying the Skimmer. On not one occasion out of the thousands of birds noted did I once behold one secure, or make any movement of the bills that would suggest that it had so secured food, while in flight. The years 1915, 1916, 1917, 1918 were without results that would tend to prove the bird secured its food in any *other* manner than the method set forth by most writers.

In 1918, while making a survey of the food habits of the Brown Pelican for the United States Food Administration's benefit, I was working from a blind on East Tambalier Island to secure motion and other photographs of a flock of Brown and White Pelicans on a shell reef. While waiting for the White Pelicans to join the Brown, I noted a commotion to the left of my blind—a wild bird chorus made by Black Skimmers and a few Laughing

Gulls. A school of small fish had been chased into a shallow flat, evidently by larger fish, and the birds were soon busy securing food.

A wheeling flock of Skimmers "skimmed" the surface of the lagoon, and then settled into the water, which was scarcely more than three inches deep, and immediately commenced to pick up fish while the birds were in a standing position. As fast as a Skimmer would secure what fish it needed in this manner, it would fly off, without doubt to its nestlings, and others would come splashing into the water, and, standing erect, would secure the fish with straight downward motions of the mandibles. While a number of arriving birds would "skim" the surface of the shallow flat before alighting at no time was there any ocular evidences of fish being picked up and, owing to my close and concealed position, had the birds so secured fish that were most plentiful I would have certainly seen such an act.

The photographs herewith submitted were made at the time and the birds can be seen in the different attitudes assumed while picking fish out of the water. Owing to the position of my blind and the tidal flat it was necessary to make the photographic exposures against the sun which accounts for the slight haziness of the pictures but they are sufficiently distinct to show the variety of attitudes assumed while the birds were actually fishing. This was the first observation made of the feeding habits of the Skimmers. Subsequently I made others, altho I was never near enough to distinctly photograph the Skimmers in the act of so securing their food, but the methods afterwards observed were absolutely identical with those first seen.

The habit of skimming with the mandibles immersed is most noticeable with Skimmers when their nesting grounds are invaded. Alarmed at one's appearance, the birds take to the air and circle about with their characteristic *yap, yap, yap, yap, yapping*. When they pass over the water certain individuals of the flock will skim close to the water, "cutting the surface" with their bills. At this time they are in a highly excited and alarmed state and are not "intent on gathering up everything edible that comes in their path!" Indeed, they are most apprehensive as to what man is

going to do to their eggs and young. Why, then, if this skimming the waters with the mandibles is a highly specialized feeding function, should they at this time adopt their so-called fishing mode of flight?

According to Wm. T. Blanford's observations of the Indian Skimmer this bird only "*occasionally* catches fish" while skimming and he doubts if it is their general custom to so secure food, and asserts that the actual use of the peculiar bill is still unknown. I cannot but feel that this is equally true of *Rynchops nigra*. In the case of the actual capturing of prey that I have observed I note that the Skimmer always fishes in very shallow water and while in a standing position. The act of seizing prey is done by straight downward motions of the head and neck, something akin to the chopping movement of an axe. The fish are seized and held at right angles to the bird's bill before swallowing, and the movements necessary to secure the fish are rather slow and deliberate. When seized and held the Skimmers do not show any marked ability to "deftly swallow their prey," as a matter of fact, the act of swallowing is rather labored and accompanied by a great deal of shaking of the mandibles to place the fish in the proper "head foremost" position to insure unobstructed passage to the crop. "Skimming" birds joining the feeding birds perform the "cut water" trick with *both* mandibles closed tight before alighting and commencing feeding in the manner just set forth.

I therefore count it more than merely strange that with the opportunities that I have had to observe the act, I have yet to see a Skimmer secure its fish food by the skimming method set down in ornithological literature by veteran and abler observers.¹

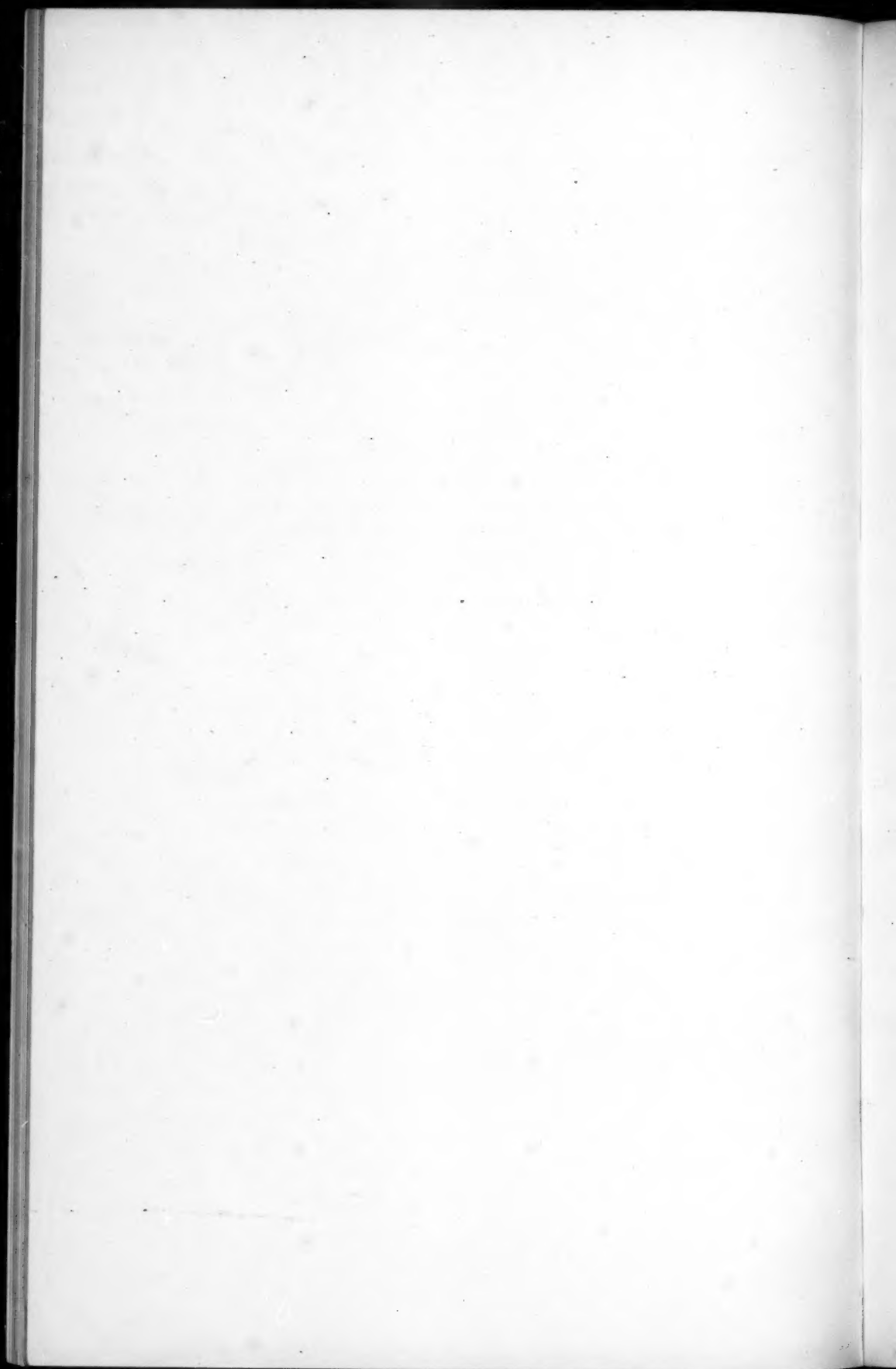
When carrying fish to their young the parent birds carry the whole fish crosswise in their mandibles. This I have observed on hundreds of occasions. Examinations of the food show that the Skimmers, at least in Louisiana, feed *exclusively* on small fish, and of a great variety of species. I have found they feed upon,

¹ Cf. General Notes beyond. Ed.



BLACK SKIMMERS (*RYNCHOPS NIGRA*).

1. Bird in center cleaving water with one mandible, not feeding.
2. Feeding on Fish on a Tidal Flat.



the following species arranged in the order of their numerical importance: *Cynoscion nothus*, *Atherina* sp. (Siversides, note Wilson's observation), *Mugil cephalus*, *Scomberomorus maculatus*, *Pomatomus saltatrix*, *Cynoscion nebulosus*, *Sciaenops ocellatus*, *Trachinotus carolinus*, *Carangus hippos*, and others unidentified.

The majority of these fish were secured on the breeding grounds being the food carried to feed the young. The largest fish fed to the young that I was able to secure was 73 mm. in length, but fish this size are only fed to young with feathers. The Black Skimmers have two ways of feeding their young. The downy young are fed by regurgitation, the food being dropped on the ground by the parent bird, but so avid are the little ones for food that they pick at the parent bird's bill as the fish is being dropped, they then pick it up as a tiny chick would take up moistened bread. When the nestlings commence to show feathers they are fed entire fish. The adults fly in from their fishing grounds with the food carried cross-wise in the mandibles and it is given direct to the young bird which invariably secures it head-first. If, by chance, the fish is first dropped to the ground the nestling will secure it by turning its head and bill side-wise. This is not a difficult task and at this time there does not seem to be any physical reason for so doing as at this period the difference in length between the upper and lower mandibles is slight but, to me, indicates a precocity that will prove useful in the adult stage. When Skimmers are first hatched the bills are of equal length and it is not until the young are some weeks old that the curious formation of the lower mandible begins to show by slightly exceeding the upper one in growth.

Attentive observation of the young in various stages was barren of results in a search for a reason for the unusual and unequal growth of the Skimmer's mandibles. The answer lies wholly with the adult bird.

Audubon's assertion that Skimmers "spend the whole night on the wing, searching diligently for food" is not borne out by my observations. While a few of the birds are heard at night I would not say that they are nocturnal but that they are, to a marked

degree, crepuscular. During the reproduction period their fishing habits must be diurnal, especially if young are to be fed.

The insistence of most writers that the skimming is done "with the *under* mandible immersed" does not agree with my observations. The skimming and "plowing the main" is usually done with the mandibles closed save for the times they are opened to permit the cry or "bark." This I can show by photographs of the birds in the act of cleaving the surface of the water. In my collection of photographs I have but one showing the bird cutting the water with its lower mandible only and this bird was "yapping" loudly when so flying over the surface.

My conclusions are that the Black Skimmer does not secure its food in the way generally set forth and that the function of the unique inequality of the mandibles is as yet unknown.

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EXPLANATION OF PLATES.

Plate XX, fig. 1. Black Skimmer cleaving the water with its lower mandible only. This bird was excited and apprehensive over my nearness to its nest of eggs and was not fishing. It was emitting its characteristic "yap, yap, yap" while circling me and when it would pass the tidal flat would lower itself to the surface of the water and cut it with its bill.

Plate XX, fig. 2. Skimmers feeding on a school of fish in a tidal flat. The different attitudes adopted while securing fish can be seen by close inspection. The two birds in the upper left can be observed in the act of catching their prey. One is making straight downward plunges of its mandibles while the other is belly deep in the water having a tussle with the bastard weakfish it has caught (the school consisted of *Cynoscion nothus*). One Skimmer can be observed in the act of alighting in the water to fish in preference to securing food by "skimming" which, in this case, would have been an easy matter if this were its mode of fishing.

Plate XXI, fig. 1. The same flock fishing in the same flat. Note one bird joining the others by skimming over the water with both mandibles closed. After alighting it fished as did the others—standing in the water.

Plate XXI, fig. 2. Skimmers in flight over the water and cleaving it. Note that the two lower birds are cutting the water with the mandibles closed.



BLACK SKIMMERS (*RYNCHOPS NIGRA*).

1. Fishing on a Tidal Flat.
2. In Flight over the Water.



DESCRIPTIONS OF SEVEN NEW FORMS OF JAPANESE
AND COREAN PICIDAE.

BY NAGAMICHI KURODA, C. F. A. O. U.

DR. LEONHARD STEJNEGER was the first ornithologist to review the Japanese Woodpeckers (Proc. U. S. Nat. Mus. pp. 99-124, 1886). After his paper we have no other review of these birds except some catalogues or manuals containing descriptions of the species, such as those by Edward Hargitt (Cat. Birds Brit. Mus., Vol. 18, 1890), H. E. Dresser (Man. Palaearct. Bds., Part I, pp. 437-456, 1902), and Dr. Ernst Hartert (Vog. palaearct. Fauna, Vol. 2, pp. 888-941, 1912). Mr. Seinosuke Uchida (Nihon Chorui Zusetsu, Vol. 2, pp. 357-372, 1914, and suppl. pp. 182-185, 1915) also mentions the species of Japanese woodpeckers and makes some remarks upon them. In the present paper are presented descriptions of seven apparently new forms of the family from Japan and Corea.

I beg to tender my sincere thanks to Dr. Leonhard Stejneger and the Associate Curator of Birds in the U. S. National Museum who kindly permitted the examination of the paratype of *Dryobates leucotos subcirris*.

***Dryoscopus martius morii* subsp. nov.**

Diagnosis.—Similar to *D. martius silvifragus* Riley. from Hokkaido and Sakhalin Islands, but distinguished from it by the thicker bill, by the broader base of the upper mandible, by the ridge of the lower mandible being mostly white instead of dark colored and distinct to the base though not sharply defined, and by the culminal ridge being more distinct. The shape of the bill, moreover, especially the lower view of the lower mandible is very different, being less abruptly pointed in the new form. In dry skins the light parts of both mandibles are horn-color tinged with olive, instead of pinkish, as in specimens of *D. m. silvifragus* before me. From *D. m. martius* the new form differs in its larger size, especially the longer wing, while it differs from *D. m. reichenowi* in having the wing distinctly shorter.

The type specimen is from Gunpojo, Keiki District, Central Corea Adult male, November, 1913. No. 1342 Coll. N. Kuroda. It was presented to me by Mr. Tamezo Mori of the Seoul Higher Common School, in honor of whom I have proposed the subspecific name.

Habitat.—Probably confined to the Korean Peninsula.

Measurements.—Five males from Corea, including the type: wing, 245 (243–346 mm.); tail, 168 (165–174); tarsus, 35 (34–37); outer anterior toe, 25 (24–25); outer posterior toe 23 (22–23.5); inner anterior toe, 18.5 (18–19); inner posterior toe, 11 (10–12); culmen, 65.1 (63–67.5); width of upper mandible at base, 22 (22–22.5). No females have been examined.

Type: wing, 246 mm.; tail, 165; tarsus, 35.5; outer anterior toe, 25; outer posterior toe, 22; inner anterior toe, 18.5; inner posterior toe, 10; culmen, 63; width of upper mandible at base, 22.5.

***Picus awokera takatsukasae* subsp. nov.**

Diagnosis.—Resembles *P. awokera horii* Takatsukasa, of Kiusiu and Shikoku but distinguished by the much darker general coloration and less of the green tinge; by the wing-coverts being deeper in color and less bright; by the dark yellowish olive instead of bright yellow under tail-coverts; and by the under parts being tinged with gray instead of olive green. Head, sides of neck and face also distinctly darker.

The type specimen is from Anno, Tanegashima, one of the largest islands of southern Kiusiu. Adult female, January 4, 1920, collected by Mr. T. Yasaka. No. 5298 Coll. N. Kuroda. The subspecific name is given in honor of Prince N. Takatsukasa, President of the Ornithological Society of Japan.

Habitat.—Probably confined to the island of Tanegashima, southern Kiusiu.

Measurements.—Wing, 135 mm.; tail, 94.5; tarsus, 24; outer anterior toe, 21.5; outer posterior toe, 18.5; inner anterior toe, 15; inner posterior toe, 7.5; culmen, 33.5; width of upper mandible at base, 11.5.

Mr. Ogawa examined two specimens from Tanegashima, taken in November and December, and wrote as follows: "Both quite identical with Hondo specimens" (Annot. Zool. Japon. V., p. 202, 1905). This identification is, however, probably in error as the Hondo form (*P. a. awokera*) is much paler than that from Kiusiu (*P. a. horii*) while the present race is the darkest of all.

***Yungipicus kizuki matsudairai* subsp. nov.**

Diagnosis.—Very similar to *Y. k. kizuki* of Kiusiu, but the wing averages longer, 81–88.5 mm. in the present form instead of 79–83.5 mm. in *kizuki*, while the upper mandible is rather broader at the base, 7.5 mm., instead of 6–7 mm.

The type specimen is from Miyakeshima, one of the seven islands of Izu, Japan. Adult male February 15, 1918, collected by Y. Iwaya. Coll. N. Kuroda, No. 3160. The subspecific name is in honor of Viscount Y. Matsudaira who kindly loaned me his series of specimens from Miyakeshima.

Habitat.—Confined to the Seven Islands (Miyakeshima) of Izu, Japan.

Measurements.—Four males: wing, 81–83 mm.; tail, 47–48.5; tarsus, 14.5–15; outer anterior toe, 10–11; outer posterior toe, 12–13; inner anterior toe, 8.5–9.5; inner posterior toe, 5–6; culmen, 16.5–17; width of upper mandible at base, 7.57.

Five females: wing, 85–88.5 mm.; tail, 47.5–50.5; tarsus, 15; outer anterior toe, 11–11.5; outer posterior toe, 13–13.5; inner anterior toe, 9–9.5; inner posterior toe, 5.5–6; culmen, 16.5–17; width of upper mandible at base, 7.5.

Type: wing, 82.5; tail, 47; tarsus, 15; outer anterior toe, 10; outer posterior toe, 12.5; inner anterior toe, 8.5; inner posterior toe, 5; culmen, 17; width of upper mandible at base, 7.5.

I have examined nine specimens of this subspecies and the characters mentioned above are constant. Dr. Hartert also found that two specimens from the same island had the wing longer than typical *kizuki* and wrote as follows: "Zwei Exemplare von Mijakeschima (Sieben-Inseln) scheinen auch zu dieser Form (*kizuki*) zu gehören, Obwohl die Flügel 83 (♂) und 87 mm. (♀) messen. (Grössere Masse finden sich bei diesen Formen oft, aber nicht durchweg, bei den Weibchen)." (Vogel. Palaearct. Faun., 2. p. 928.)

***Dryobates major hondoensis* subsp. nov.**

Diagnosis.—Resembles *D. major japonicus*, from Hokkaido and rarely north Hondo, but differs in the under parts averaging deeper buffy or brown, never nearly pure white; the ear-coverts are also almost always tinged with light brown, the white scapulars are more or less tinged with buffy as is also the frontal patch while the white spots on the wings are smaller. From *D. m. tschkerskii* it differs in having the under parts distinctly darker and the upper mandible narrower at the base—9.5–11 mm. instead of 12–12.5 mm.

The type specimen is from Minami-azumi-gori, Prov. Shinano, central Hondo. Adult male collected by T. Takayama, January, 1920, No. 4927, colln. N. Kuroda. It is a specimen in the dark phase of plumage.

Habitat.—Hondo, Japan, extending from northernmost Hondo to the central parts (Prov. Suruga). I have not seen specimens from south of Prov. Suruga. This form is no doubt a palaearctic bird and does not range so far south as the next species (*D. leucotis* group). It breeds on Norikura and Takenoshita, Prov. Suruga. One specimen from Corea agrees perfectly in color with the Hondo form but five others from that country are typical *japonicus* in every respect, so that the occurrence of *hondoensis* in Corea is still questionable. The type locality of *japonicus*

was designated by Dr. Stejneger as Yesso (= Hokkaido). It rarely visits northern Hondo.

Measurements.—Twenty-two males: (Hondo) wing 124–135.5 mm.; tail, 77–85.5; tarsus 20–22.5; outer anterior toe, 14.5–16; outer posterior toe, 16.5–18; inner anterior toe, 11.5–13; inner posterior toe, 6–8; culmen, 28.5–32; width of upper mandible at base, 9.5–11.

Twenty-three females: (Hondo) wing, 124–134; tail, 76.5–90; tarsus, 20–22.5; outer anterior toe, 14.5–16; outer posterior toe, 16–18.5; inner anterior toe, 11.5–13; inner posterior toe, 7–8; culmen, 27.5–30.5; width of upper mandible at base, 9.5–11.

Female from Corea: wing, 128.5; tail, 83; tarsus, 21; outer anterior toe, 15; outer posterior toe, 17; inner anterior toe, 12; inner posterior toe, 7; culmen, 31; width of upper mandible at base 11.

Type: wing, 129 mm.; tail, 85.5; tarsus, 20; outer anterior toe, 15; outer posterior toe, 17; inner anterior toe, 11.5; inner posterior toe, 7; culmen, 31, width of upper mandible at base, 10.

Dr. Stejneger considered this dark phase to be identical with "*Dryobates gouldii* (Malh?) Gray" (Proc. U. S. Nat. Museum, 1886, p. 112). This statement is however in error. The Hondo bird has white scapulars as in true *japonicus* and *tscherskii* and not wholly black as in *cabanisi* (= *gouldii*). He however mentions the question of the occurrence and validity of the so-called *D. gouldii* from Japan (Proc. U. S. Nat. Mus., 1892, pp. 299–300). He also states that the Tokyo specimen has all the white portions strongly washed with deep ferruginous, evidently a superficial stain (op. cit., 1893, p. 630). I have examined forty-five specimens from many parts of Hondo with the following result:

(a) In the Hondo specimens (*hondoensis*) all adults, the under parts vary from pale to very dark and the birds are divisible into three phases: a pale one represented by seven examples; a medium one with fourteen examples and a dark one to which eighteen are referable. The typical *japonicus* from Hakkaido is distinctly paler than even the pale phase of *hondoensis*.

(b) The bars on the outermost tail feathers vary from very distinct and broad to very narrow while extreme examples have them broken up into spots. A specimen from Wakayagi, Prefect Miyagi, Hondo, has only one spot on the outer web of the outermost tail feathers. I am therefore inclined to think that the shape and number of bars on the outer tail feathers of this form

have no value in systematic study, being subject to individual variation.

***Dryobates leucotis stejnegeri* subsp. nov.**

Diagnosis.—Very similar to the deeper colored phase of *D. leucotis subcirris* from Hakkaido, but distinguished by the white of the back and under surface being always more strongly washed with buff. The white spots on the wing are constantly smaller while the wing is shorter and the red on the abdomen much deeper. It differs essentially from the paler colored phase of *subcirris* from Hakkaido.

The type specimen is from Minami-azumi-gori, Prov. Shinano, central Hondo. Adult male, collected by T. Takayama, November, 1918. No. 4931, colln. N. Kuroda. Named in honor of Dr. L. Stejneger.

Habitat.—Apparently confined to northern and central Hondo (Nagano, Nikko, etc.). It breeds in trees at Nikko and Hida. South of Yokohama, on the Pacific side of Hondo there are two other forms.

Measurements.—Six males: wing, 149–152.5 mm.; tail, 84–95; tarsus, 25–26.5; outer anterior toe, 16.5–19.5; outer posterior toe, 20–22.5; inner anterior toe, 13.5–16.5; inner posterior toe, 7.5–9; culmen, 42–42.5; width of upper mandible at base, 13.5–14.5.

Four females: wing, 141–151; tail, 84–92; tarsus, 25–27; outer anterior toe, 17.5–20; outer posterior toe, 20.5–22; inner anterior toe, 14–15.5; inner posterior toe, 8.5–10; culmen, 40; width of upper mandible at base, 12.5–14.5.

Type specimen: wing, 152.5; tail, 95; tarsus, 25; outer anterior toe, 18.5; outer posterior toe, 21.5; inner anterior toe, 15; inner posterior toe, 9; culmen, 42; width of upper mandible at base, 14.

I have compared ten specimens from the central and northern parts of Hondo with fifteen of the true *subcirris* from Hakkaido with the following results.

(a) Only one form (*subcirris*) occurs in Hokkaido but there are two color phases. One of these has the paler under parts almost as white as in *uralensis* but its proportions are larger. The other has the under parts somewhat tinged with buffy as stated by Dr. Stejneger. (Proc. U. S. Nat. Museum, 1886, pp. 113–115.)

(b) Thanks to Dr. Stejneger I have had the opportunity of examining the paratype of *D. l. subcirris* from Sapporo, obtained by Blakiston, October 12, 1882, No. 96001, colln. U. S. N. M., adult female). Dr. Stejneger's description of the type (op. cit. 1886, p. 113) agrees well with this paratype but differs somewhat from other Hakkaido specimens before me though among the latter I find some similar in color to the one that Stejneger de-

scribed. These birds are however practically differentiated from Hondo examples by the decidedly larger white area on the lower back and by the decidedly larger white spots on the wing, larger even than in some of the buff tinted specimens. Stejneger's type specimen must be separated from the Hondo birds and it apparently belongs to the deeper colored phase of the Hokkaido form. The Hondo bird never occurs in Hokkaido.

(c) The white area on the lower back and rump in true *subcirris* is subject to variation, being larger in full plumaged winter specimens and smaller in those taken in summer, just after the molt, or in autumn when the feathers have not attained their full growth. The black lower back (tergum) is covered with white feathers but the amount of white here and on the rump is variable being apparently more developed in Hokkaido examples as mentioned by Dr. Stejneger.

(d) There are no doubt two phases of *stejnegeri*, the Hondo form. One of these is darker colored and the other paler and much nearer to the Hokkaido race, though the white on the back is much restricted and does not extend to the upper back while the white spots are usually smaller and the ear-coverts always tinged with light brown.

(e) The greater wing-coverts in *stejnegeri* have the white spots on the outer webs shorter than in *subcirris* being 7-9.5 mm. (rarely 11) in the former and 9-12.5 mm. (rarely 14 or 15 mm.) in *subcirris*.

(f) The pale spots on the third pair of tail-feathers are very much smaller in *stejnegeri* than in *subcirris* as Mr. Uchida has pointed out (Nihon Chorui Zusetsu, Vol. 2, p. 363) and the variation in the size of these spots is not so great.

***Dryobates leucotis intermedius* subsp. nov.**

"1913. An intermediate form between *Picus leuconotus subcirris* (Stejneger) and *Picus namiyei* (Stejneger)," Kuroda, (Dobutsugaku Zasshi, 1913, p. 333) from Dorogawa, Prov. Yamato, Hondo.

Diagnosis.—Near to *D. leucotis namiyei*, but with the pale area on the back larger, the white spots on the greater wing-coverts larger and three in number instead of two (or entirely lacking); the streaks on the chest and breast fewer in number and the ear patch and lateral neck patch us-

usually continuous above or only partly separated by a black line. Differs from *D. l. stejnegeri* in having the pale area on the back smaller, the white wing spots especially on the coverts smaller and the red of the under parts deeper and extending farther forward.

The type specimen is from Dorogawa, Prov. Yamato, Hondo. Adult female obtained by Mr. N. Teraoka, January 4, 1913. No. 948 colln N. Kuroda.

Habitat.—This intermediate form inhabits the Pacific side of Hondo from Prov. Sagami and Suruga to Prov. Yamashiro, Kii and Yamato as well as Prov. Iyo Shikoku where *D. l. namiyei* also occurs. The specimens from Yamashiro are on the average whiter than those from Yamato and Kii, while an example from Sagami is paler than two from Suruga. This race is no doubt a climatic form and not a hybrid between *stejnegeri* and *namiyei* as considered by Viscount Matsudaira.

Measurements.—Five males (Yamashiro): wing, 147–155; tail, 90–96.5; tarsus, 24–26; outer anterior toe, 17.5–20; outer posterior toe, 20.5–21.5; inner anterior toe, 14–16; inner posterior toe, 8.5–9.5; culmen, 39–42; width of upper mandible at base, 13–14.

Four females (Yamashiro): wing, 140–148.5; tail, 89–91.5; tarsus, 23–23.5; outer anterior toe, 18–20; outer posterior toe, 20–22.5; inner anterior toe, 14–16; inner posterior toe, 7.5–9; culmen, 38.5–42; width of upper mandible at base, 13.5–14.

Type (Yamato): wing, 151; tail, 93; tarsus, 23; outer anterior toe, 17.5; outer posterior toe, 21.5; inner anterior toe, 13.5; inner posterior toe, 8; culmen, 40; width of upper mandible at base, 14.

An examination of seventeen specimens, ten of which were kindly loaned to me by Viscount Matsudaira, yields the following results:

(a) The under parts vary from bright carmine to rose color tinged with carmine or even to grayish rosy.

(b) The subapical white spots on the greater wing-coverts vary from almost as large as in *stejnegeri* to very small as in *namiyei*. The spots on the greater wing-coverts are usually three but on some feathers four, one spot being in that case nearly obsolete.

(c) The white area on the lower back varies considerably in size, the buff tinge being always more or less noticeable. In the type the white back is distinctly tinged with buff while the lower parts are washed with rosy.

(d) The ear-coverts are always tinged with light brown though the color varies somewhat in depth.

***Jynx torquilla hokkaidi* subsp. nov.**

Diagnosis.—Very similar to *J. t. japonica* from Hondo and southward, but differs in the bill being rather longer and higher at the nostril and not so flattened; the distance between the lower edge of the nostril and the cutting edge of the upper mandible is broader, measuring 3 mm. instead of 1.5–2 mm. in *japonica*. In size it is indistinguishable from the latter form. The type specimen is from Yubetsu, Prov. Kitami, Hokkaido. Adult male, collected by Mr. N. Teraoka. No. 568 colln. N. Kuroda.

Habitat.—Island of Hokkaido where it certainly breeds. Stejneger also mentions that the Wryneck breeds in Yesso. A specimen from Sakhalin examined by me belongs to the Hondo form (*japonica*).

Measurements.—Male (type): wing, 79 mm.; tail, 64; tarsus, 18.5; outer anterior toe, 16.5; culmen, 18.5; depth of bill at nostril, 7.

Female: wing, 79 mm.; tail, 62; tarsus, 19.5; outer anterior toe, 17.5; culmen, 20; depth of bill at nostril, 7.

I have examined a pair of adults and a young fledgling from Kitami, Hokkaido. It would seem that a kind of dichromatism is found in this bird as pointed out by Dr. Stejneger (Proc. U. S. Nat. Museum, 1892, p. 296). My specimens belong to the paler phase.

Fukuyoshi Cho, Akasaka, Tokyo, Japan.

NOTES FROM CONNECTICUT.

BY LOUIS B. BISHOP, M. D.

SINCE 'The Birds of Connecticut' was published in 1913 additional specimens have been taken of several of the rarer species; others have been found on earlier or later dates; and a number of species or subspecies taken that were then unknown in the State; all of which it seems advisable to put on record. The specimens collected are in my collection, when not otherwise stated, and were found by myself, when no collector is mentioned. The Glaucous Gull, European Widgeon, Labrador Horned Owl, Say's Phoebe, and Prairie Marsh Wren are new records for Connecticut; and the Boreal Flicker, Nova Scotia Song Sparrow and Newfoundland

Yellow Warbler have not before been reported, though doubtless all occur regularly. The Song Sparrow and Yellow Warbler seem to me good races, as I had long noticed the difference between the specimens here recorded and other Connecticut examples, but I doubt the advisability of recognising the Flicker, as the individual variation seems to be almost, if not quite, as great as the geographic.

Larus hyperboreus. GLAUCOUS GULL.—Two were seen by Mr. Herbert K. Job feeding on the mud-flats off the mouth of West River in New Haven Harbor on March 18, 1916. Mr. Job was able to compare their size with Black-backed and Herring Gulls feeding with them, and thus make a positive identification. This is the first record of this species in Connecticut.

Larus atricilla. LAUGHING GULL.—The protection given these birds and the terns on their breeding grounds in Massachusetts has resulted in many more being found in Connecticut. Dr. L. C. Sanford saw a number of Laughing Gulls in New Haven Harbor in May and June, 1915, and I saw an adult there on June 10; and in August, 1917, Mr. Richard Harrison found them common there.

Oceanites oceanicus. WILSON'S PETREL.—Mr. George E. Verrill found petrels, probably this species, common in Long Island Sound in the summer of 1915, and Professor A. E. Verrill saw them occasionally near Outer Island, Stony Creek, the same year.

Lophodytes cucullatus. HOODED MERGANSER.—Two females were taken on the Quinnipiac Marshes, North Haven, on November 12, 1915, by Mr. William L. Ganung.

Anas platyrhynchos x rubripes.—A young male hybrid between the Mallard and Black Duck Mr. W. L. Ganung shot at West Haven on January 7, 1916.

Mareca penelope. EUROPEAN WIDGEON.—An adult male, with an old and young male and a female Baldpate, came to the decoys of Mr. Edgar Tullock and a friend at Grove Beach on January 2, 1920, and all were secured. Mrs. Gilbert Tullock, who was present when these birds were shot, readily identifying the Widgeon, and knowing its rarity, very kindly gave it to me in the flesh. This is the first Connecticut record.

Mareca americana. BALDPATE.—On the Quinnipiac Marshes a young female was shot by Mr. W. L. Ganung on November 7, 1913, and another on October 11, 1915, by his brother, Mr. Alanson Ganung.

Nettion carolinense. GREEN-WINGED TEAL.—A pair were shot at Clinton on December 14, 1912, and obtained from Mr. John E. Bassett, and another pair on the Quinnipiac Marshes on October 25, 1917, by Mr. Alanson Ganung.

Spatula clypeata. SHOVELLER.—Mr. Alanson Ganung shot a young male on the Quinnipiac Marshes on October 11, 1916.

Dafila acuta. PINTAIL.—A pair of young were taken on the Quinnipiac Marshes on October 2, 1913, by Mr. W. L. Ganung, and a young male there by Mr. A. Ganung on October 7, 1919.

Aix sponsa. WOOD DUCK.—An adult male was shot at Black Hall on December 22, 1914, the sportsman not recognizing its identity until it had been killed.

Marila valisineria. CANVAS-BACK.—A male and a female were taken at West Haven on December 7, 1912, by Mr. W. L. Ganung, and a male on December 31, 1914, by Mr. John E. Haines; and a female on the Quinnipiac Marshes on October 25, 1917, by Mr. A. Ganung.

Marila collaris. RING-NECKED DUCK.—Mr. Alanson Ganung shot two young females on the Quinnipiac Marshes on October 29, 1919.

Histrionicus histrionicus. HARLEQUIN DUCK.—A young male was shot at Branford on December 23, 1913, by Dr. L. C. Sanford and Lord William Percy. It is now in the collection of Lord Percy.

Branta bernicla glaucogastra. WHITE-BELLIED BRANT.—A young male was shot from a flock on the Sound at West Haven on December 18, 1915, by Mr. W. L. Ganung. Professor A. E. Verrill informed me that on May 17, 1914, he saw, with Mr. G. E. Verrill, many flocks of Brant flying north up the Housatonic Valley near the mouth of the Housatonic River; that most were high in the air, but some almost within gunshot; also that he saw others flying northwest while at Outer Island, Stony Creek, about May 22.

Olor columbianus. WHISTLING SWAN.—A young bird, said to have been a member of a flock of four, was shot on the marshes at the mouth of the East Haven River in the early part of November, 1919, by some boys, who had no idea what they had shot, and promptly dismembered it. The pieces were rescued by Mr. E. H. Armstrong of Branford, who reconstructed and mounted it. It is now in the mounted collection which Mr. Valdemar T. Hammer maintains in one of the Branford schools.

Nycticorax nycticorax naevius. BLACK-CROWNED NIGHT HERON.—Two adults and two young, which spent the nights in an evergreen near the home of Mr. H. K. Job in West Haven, were seen by him there as late in the winter as January 22, 1915. Mr. E. H. Armstrong tells me that one spent most of the winter of 1919-20 near Branford.

Rallus elegans. KING RAIL.—A young male was taken on the Quinnipiac Marshes by Mr. Alanson Ganung on October 29, 1914.

Gallinula galeata. FLORIDA GALLINULE.—On the Quinnipiac Marshes I shot a young male on September 23, 1913, and Mr. A. Ganung, a young female on October 10, 1913.

Fulica americana. AMERICAN COOT.—Mr. Eric T. Bradley shot a young male in East Haven on December 26, 1913.

***Limnodromus griseus scolapaceus*. LONG-BILLED DOWITCHER.**—Mr. Harry T. Flint collected a young male at Grove Beach on August 15, 1894, and Mr. Alanson Ganung shot a young female on the Quinnipiac Marshes on September 25, 1913.

***Arquatella maritima maritima*. PURPLE SANDPIPER.**—A young female was shot on the breakwater in New Haven Harbor on November 17, 1915, by Mr. Edward J. Haines, and Mr. E. H. Armstrong collected two in Branford early in November, 1919.

***Cathartes aura septentrionalis*. TURKEY VULTURE.**—On the morning of May 7, 1913, as I was walking along a wood-road on the northern shore of a small lake in West Haven I noticed a strong and most unpleasant odor, which seemed to come from some bushes not far away. Before I could investigate farther I saw a large bird flying rapidly toward me from across the lake, and directly against a light northerly wind, that was blowing. It came nearer and finally circled so closely above my head that there could be no question it was a Turkey Vulture. When it saw me it turned and flew south as rapidly as it came, soon disappearing in the distance. Then I discovered the cause of the odor was the body of a large dog, greatly swollen by putrefaction, that was lying about twenty feet from me, and so well screened by bushes and trees, that it was invisible from above. This is the only Turkey Vulture I have seen in Connecticut, and its actions I can only explain by the belief it had smelt that dog from far away, followed up the scent, and when it reached the spot, not seeing what it expected, had returned as rapidly, whence it came. That this bird was hunting by the sense of smell seems to me beyond question. From its actions there could be little doubt that it thought I was responsible for the delicious perfume it was following, and preferred localities where the possessors of such perfume were less active.

***Aquila chrysaetos*. GOLDEN EAGLE.**—A young female was shot in the outskirts of New Haven on October 19, 1915, by Mr. Nathan A. Small. Mr. Harry T. Flint told me that he saw one very closely in Woodbridge on October 21, 1916. This bird caught a mammal in a thicket, and let him approach within 75 feet as it sat on a post devouring its prey, so that he was able to see plainly the feathered tarsi and golden-brown neck.

***Haliaeetus leucocephalus leucocephalus*. BALD EAGLE.**—A young male Bald Eagle was shot at Lyme on November 28, 1912, and sent me in the flesh by Mr. W. E. Tinker. The length was 31.75 inches, and the extent 78.37.

***Haliaeetus leucocephalus alascanus*. NORTHERN BALD EAGLE.**—A young male was found lying dead in the woods at Indian Neck, Branford, by Messrs. J. E. and E. E. Hall, on March 14, 1915, who very kindly gave it to me. This bird showed no sign of injury, but was greatly emaciated, its pectoral muscles being so wasted that it seemed impossible for

it to have flown in the last days of its life. The length was 34.25 inches, and extent 85.

Falco peregrinus anatum. DUCK HAWK.—The eyrie on Mount Carmel mentioned in 'The Birds of Connecticut' was occupied in the spring of 1912, when Mr. Herbert K. Job found the nest, which contained three eggs on May 27, and again in 1914, when Mr. Harry W. Flint collected two sets of four eggs in April and early May.

Otus asio asio. SCREECH OWL.—Mr. Frank Sherman brought me a Screech Owl on May 30, 1916, which he had found lying dead in Evergreen Cemetery, New Haven. The bird was in perfect plumage, without sign of injury, but the abdomen was greatly distended and green, and the bird emitted a strong gangrenous odor. Protruding from the anus I found what looked like the dry membrane of an egg, and in the abdomen three great masses of dried yolk, one fully the size of a normal egg, and covered with a bloody membrane. Apparently for some reason the shells had not formed on the eggs, the bird had been unable to lay them, and they had remained in the abdomen, and killed the bird.

Bubo virginianus heterocnemis. LABRADOR HORNED OWL.—Mr. R. Beecher Huntley shot a Horned Owl of this race at Black Hall in November, 1917, and sent it to me. It was prepared for me by Mr. B. M. Hartley of New Haven, as I was in California. It is the first record for the State.

Coccyzus erythrophthalmus. BLACK-BILLED CUCKOO.—A female, which I shot in West Haven on May 14, 1915, contained an egg ready for the nest, and Mr. A. A. Saunders found a nest with young on May 28 of that year.

Melanerpes erythrocephalus. RED-HEADED WOODPECKER.—A pair bred in West Haven in 1914, and another on Prospect Street, New Haven, in 1916. Mr. and Mrs. E. C. Stiles with other members of the New Haven Bird Club saw one in Edgewood Park, New Haven, on April 10, 1920, and four, apparently two pairs, in West Haven on April 18.

Colaptes auratus borealis. BOREAL FLICKER.—If this race is accepted, to it must be referred some members of the great flight of Flickers that passes through southern Connecticut in late September and early October. Of Flickers from New Haven in my collection I identify as this three males collected on September 20 and October 1, 1904, and September 30, 1903, and two females taken on October 7, 1901, and September 29, 1903.

Sayornis sayus. SAY'S PHOEBE.—An adult female was shot at Gaylordsville on December 15, 1916, and sent me in the flesh by Mr. E. H. Austin. This bird, or a similar one, Mr. Austin saw about a quarter of a mile from his house a few days earlier, and, noticing it was not the common Phoebe, asked his son to shoot it for me, when he found it again on the fifteenth. It was fat and generally in good condition. This is another new bird for the State.

Empidonax flaviventris. YELLOW-BELLIED FLYCATCHER.—A young female was taken at New Haven on September 13, 1919.

Agelaius phoeniceus phoeniceus. RED-WINGED BLACKBIRD.—An adult male shot at Fairfield on January 17, 1894, was obtained by Mr. J. B. Canfield in the flesh, and is now in my collection, thanks to Dr. Joseph Grinnell.

Euphagus carolinus. RUSTY BLACKBIRD.—A young female collected at Stratford by Mr. W. H. Lucas on December 12, 1891, I have Dr. Grinnell to thank for also.

Hesperiphona vespertina vespertina. EVENING GROSBEAK.—A pair were secured at Pine Rock, Hamden, on March 20, 1916, by Dr. Paul Stetson. This species appeared in Branford the latter part of January, 1920, both sexes having been seen by Mr. V. T. Hammer, and females collected by Mr. E. H. Armstrong, who gave me one taken on February 3. Mr. Richard Harrison reports that a small flock spent much of the past winter on Prospect Street, and Mr. Edgar C. Stiles that three males and nine females were seen by himself, Mr. Harrison and other members of the New Haven Bird Club, on East Rock Park, New Haven, on May 2, 1920.

Loxia curvirostra perna. NEWFOUNDLAND CROSSBILL.—All the Red Crossbills that I have collected in Connecticut (recorded in 'The Birds of Connecticut'), are of the large, long-billed form, which Mr. Bent has separated under this name, except two adult males, which I obtained in North Haven on March 12, 1914. These are of the small race, that apparently is the commoner of the two in Massachusetts. Breeding crossbills, which I collected at Seabright, Halifax County, Nova Scotia, in the summers of 1914 and 1916 were also all the larger race.

Poocetes gramineus gramineus. VESPER SPARROW.—An adult male was taken in East Haven on December 30, 1913, and three others seen.

Passerherbulus nelsoni subvirgatus. ACADIAN SHARP-TAILED SPARROW.—Two males were collected in West Haven on May 29, 1914.

Spizella passerina passerina. CHIPPING SPARROW.—A young female was taken in New Haven on November 5, 1914.

Melospiza melodia acadica. NOVA SCOTIA SONG SPARROW.—Song Sparrows closely resembling Nova Scotia birds in fresh winter plumage were collected near New Haven on January 26, 1878, by Dr. W. H. Hotchkiss; December 13 and 27, 1900; October 31, 1901; September 29 and October 25, 1903; and October 15, 1905. The Song Sparrow breeding on the Magdalen Islands is even redder than the Nova Scotia bird.

Lanius ludovicianus migrans. MIGRANT SHRIKE.—An adult female was collected in North Branford on March 27, 1916. It had been feeding on beetles. I believe this is the first spring bird recorded.

Lanivireo solitarius solitarius. BLUE-HEADED VIREO.—A female

collected in New Haven on April 24, 1916, and one seen very closely there on November 7, 1915.

Mniotilta varia. BLACK AND WHITE WARBLER.—An adult male was collected at New Haven on October 13, 1913.

Helmitheros vermivorus. WORM-EATING WARBLER.—A young female was collected in West Haven on September 16, 1913.

Vermivora lawrencei. LAWRENCE'S WARBLER.—Adult males were collected near New Haven on May 20, 1913, May 18, 1915, and May 9, 1916. The first is in a plumage intermediate with *V. chrysoptera*, and had the song of this species.

Vermivora leucobronchialis. BREWSTER'S WARBLER.—Adult males were collected near New Haven on May 19, 1914, and May 14, 1915. Both had the song of *V. pinus*.

Vermivora peregrina. TENNESSEE WARBLER.—Additional fall records for the vicinity of New Haven are September 27 and October 4, 1913; October 4, 1915; and October 2, 1916. In spring I had never found this warbler until 1916, when it was tolerably common from May 18 to 27. That this bird is really extending its range is shown also by my experience with it at Seabright, Nova Scotia, where I spent the summers of 1914, '15, and '16. The first summer I did not find it at all, collected one male the second, and on the third found it common in the same locality where I had collected almost daily the two previous years, though no change whatever had occurred in the vegetation.

Dendroica tigrina. CAPE MAY WARBLER.—This is another species the records of which in Connecticut have multiplied in recent years. A male was collected near Derby by Mr. J. T. Cullen on May 20, 1912, and one by myself in West Haven on May 19, 1916. New fall records for New Haven are September 15 and 24, 1913, and October 2, 1916.

Dendroica aestiva amnicola. NEWFOUNDLAND YELLOW WARBLER.—If this subspecies is recognized as valid to it must be referred two young males, which I collected at West Haven on September 14, 1904, and New Haven on September 15, 1913, and a young female collected by Mr. A. H. Verrill on Outer Island, Stony Creek, on September 10, 1907. This is the form of Yellow Warbler, which breeds on the Magdalen Islands.

Dendroica magnolia. MAGNOLIA WARBLER.—An adult male was collected at New Haven on October 21, 1905.

Dendroica pensylvanica. CHESTNUT-SIDED WARBLER.—An adult female was taken at New Haven on September 28, 1912, and a young male on September 29, 1915.

Dendroica castanea. BAY-BREASTED WARBLER.—Additional fall records of young birds from New Haven are two on September 15, 1913, and one on October 2, 1916.

Dendroica fusca. BLACKBURNIAN WARBLER.—Young of this bird

were taken at New Haven on September 24, 1913, and September 22, 1917.

Dendroica vigorsii. PINE WARBLER.—A male was collected at Guilford on April 1, 1916.

Dendroica palmarum palmarum. PALM WARBLER.—Increasing numbers of fall records of this race near New Haven make more probable that Connecticut is in its regular migration route. One was collected on September 28, 1895, by Mr. H. W. Flint, and others on October 12, 1914, and September 13 and 26, and October 8, 1919, by myself.

Seiurus noveboracensis notabilis. GRINNELL'S WATER THRUSH.—That Connecticut is on the regular migration route of this bird also I now believe. A male that I collected in West Haven on May 15, 1914, and a young male in New Haven on September 15, 1913, closely resemble *notabilis* from Alaska and North Dakota, and must be placed with this race.

Oporornis philadelphia. MOURNING WARBLER.—An adult male was collected in West Haven on May 22, 1916.

Wilsonia canadensis. CANADA WARBLER.—A young female collected at New Haven on September 11, 1917, is the latest fall record, and a male seen on August 11, 1919, the earliest.

Mimus polyglottos polyglottos. MOCKINGBIRD.—Mr. Harry W. Flint told me that he saw a dead male on April 8, 1914, that was accidentally killed on that day by a man in whose garden in New Haven it had lived since Feb. 28.

Nannus hiemalis hiemalis. WINTER WREN.—One collected at New Haven on September 15, 1913, is the earliest fall record, and one, which was collected at Beacon Falls on November 27, 1884, and given me by Dr. J. Grinnell, is a late one.

Telmatoodytes palustris iliaceus. PRAIRIE MARSH WREN.—A female Marsh Wren, taken by Mr. H. W. Flint near New Haven on October 9, 1895, and now in my collection, Dr. Oberholser agrees with me in calling *iliaceus*, of which race it seems typical.

Penthestes hudsonicus littoralis. ACADIAN CHICKADEE.—One was collected in North Haven on December 2, 1913.

Hylocichla aliciae bicknelli. BICKNELL'S THRUSH.—A male, collected in West Haven on May 27, 1916, is the latest spring date.

Planesticus migratorius migratorius. ROBIN.—A nest containing young only a few days old noted at New Haven on September 1, 1919, is almost a month later than the latest in 'The Birds of Connecticut.'

356 Orange St., New Haven, Conn.

SOME SOUTHERN MICHIGAN BIRD RECORDS.

BY NORMAN A. WOOD.

THE records in the Museum of Zoology, University of Michigan, apparently indicate that several species of birds are in Michigan extending their ranges to the northward, or are becoming more common. The observations on these species are included in the following notes made in Washtenaw County, with some unpublished records of rare forms.

Marila collaris. RING-NECKED DUCK.—Covert, 1881, records this species as "a common migrant". Since that date very few records have been made in this vicinity, and Barrows, 1912, lists it as "a scarce migrant". March 20, 1909, two were seen on the Huron River and a fine adult male, is in the Museum. On April 8, 1912, two were taken from a flock of ten, one of which is now in our collection. Other records are as follows: March 15, 1913; March 15, 1914; April 3, 6, 1914, one or two on Huron River near Ann Arbor; November 16, 1919, one was shot on a small lake near Ann Arbor. The last is our only fall record of this rare duck.

Grus mexicana. SANDHILL CRANE.—On May 30, 1880, the writer saw fifteen Sandhill Cranes in a wheat field in Sharon Township, in the western part of Washtenaw County. The following data were secured in Lyndon Township: May, 1896, a nest containing two eggs; May 25, 1897, a fine adult male; October 25, 1900, an adult female. In October, 1910, an adult bird was taken in the same region by Charles Clark who saw twenty in a flock on March 24, 1911. On September 15 and 26, 1915, two adult males were shot at Mud Lake, Lyndon Township, Washtenaw County both of which are now in the Museum collection. Mr. Koels reported that he saw twenty-eight there at one time and that a few still breed in a big wet marsh near there, in Jackson County. While the writer was collecting for the Museum on Whitefish Point in the Upper Peninsula, in 1912 and 1914, several birds were seen and hunters said they bred there in the big swamps.

Astur atricapillus atricapillus. GOSHAWK.—Covert, in 1881, lists this species as "a rare winter visitor" which coincides with the experience of the writer who has only the following records for Ann Arbor: an adult male, January, 1897; an immature male, November 20, 1898; December 18, 1917, adult male. When this species wanders south it seems to follow the shores of the Great Lakes, and only rarely occurs inland as far as Ann Arbor.

Archibuteo lagopus sancti-johannis. ROUGH-LEGGED HAWK.—

This species only occurs in Washtenaw County as a rare migrant. The first ones were seen by the writer on January 2, 1888. The next ones were noted March 15, 1897, and March 20, 1899 (a fine male taken in a trap). Since 1899 it has been recorded October 5, 1908; October 30, 1909; March 23, 1912; January 1, October 15, 1917; October 18, 1917 (a bird in black plumage). The writer saw many of this plumage phase among the hundreds that were migrating in May, 1914, at Whitefish Point, Chippewa County, Michigan.

***Aluco pratincola*.** BARN OWL.—Although this southern species has always been listed as rare in Michigan, many recent records show that it is more common than was formerly supposed. The range covers the Southern Peninsula and there is a record of its occurrence near Sault Ste. Marie. There are twenty records for Ann Arbor and vicinity, made at all seasons of the year. Some of the Washtenaw County records are October, 1890 (the first Michigan bird seen by the writer); October 15, 1898, three taken in a swamp; August 25, 1895; May 13, 1900; December 12, 1904; August, 1906; October 15, 1909; April 28, 1912; May 11, 1912, adult female; June 16, 1919, adult male; September 20, 1919, adult female; October 22, 1919.

***Cryptoglaux acadica acadica*.** ACADIAN OWL.—This species is a rare migrant and occasional resident in Washtenaw County. On May 23, 1879, a nest was reported near Ann Arbor, and on January 10, 1881, three were taken in a small tamarack swamp. Other records are December 10, 1896; May 5, 1897 (an adult female that no doubt had bred that season); February 1, 1905; November 30, 1910; April 24, 1915; November 20, 1915 (two seen and one taken). Since that latter date none were reported until April 9, 1919, when one was taken at Ann Arbor.

***Hesperiphona vespertina vespertina*.** EVENING GROSBEAK.—There are no records of this species for Ann Arbor previous to January 10, 1887. Since then it has occurred here on the following dates: common from January to April 12, 1890; about fifty observed April 14, 1889; a few seen in 1904 at Ypsilanti; November 25, 1916, six seen in Ann Arbor; November 28, 1908, a few noted; from January 19 to March, 1911, a flock of twenty recorded by the writer about Ann Arbor feeding on the seeds of the ash maple; February 7, 1919, four were seen in Ann Arbor by the writer, and a flock of thirteen was observed in Ann Arbor on January 5, 1920, by A. D. Tinker.

***Loxia curvirostra minor*.** CROSSBILL.—Covert, 1881, lists this specimen as "a very rare winter visitor." The writer's records are March 18 to 27, 1869; the winter of 1874; May, 1880, three shot in an orchard a few miles from Ann Arbor; March 31, 1885, a small flock seen in an orchard by the writer; March 26, 1883, Dr. J. B. Steere, collector; November 7, 1908, a flock of twelve seen feeding on the seeds of evergreens on the University campus; November 18, 1913, two shot from a small flock

near Ann Arbor; January 5, 1914, five birds seen in Ann Arbor, April 7, 1914.

***Loxia leucoptera*.** WHITE-WINGED CROSSBILL.—In 1881 Covert lists the species as a "rare winter visitant," but gave no record of its occurrence. The writer considers it rarer than the preceding species and has but four records since 1870. Dr. J. B. Steere collected one on March 26, 1883, at Ann Arbor. On November 5, 1899, three of these birds were seen on the campus extracting seeds from the cones of a small pine. They were near the ground and so tame that the writer could almost touch them. One was taken and six seen near Ann Arbor on January 19, 1907. On December 20, 1906, a single bird was found in a car loaded with wheat. This bird was kept alive until May; the plumage was oddly marked with feathers of greenish yellow. On July 31, 1916, a juvenile bird was found dead in the water of Douglas Lake, Cheboygan County, Michigan, this being the most southern summer record for Michigan. It may have been raised there as it was too young to have flown far. There is but one Michigan breeding record (Butler, Birds of Indiana, 1897, p. 922) for Delta County, Michigan, April 21, 1891.

***Pinicola enucleator leucura*.** PINE GROSBEEK.—This is a much rarer winter visitor in Washtenaw County than the Evening Grosbeak. The first record is a specimen in the Museum taken at Ann Arbor November 17, 1870. It occurred again in the winter of 1874-5. The writer has seen it only once: on December 23, 1913, a flock of about twenty stayed at Ann Arbor for some time feeding on frozen apples and buds of the evergreen; the last time they were observed being January 1, 1904. The only subsequent record is that of January 1, 1907, when two were seen and one specimen taken.

***Ammodramus savannarum australis*.** GRASSHOPPER SPARROW.—At Ann Arbor in 1881 this species was listed as a "rare summer resident," but it was not seen by the writer until May 11, 1895, when it was noted in a few meadows. It is now quite a common, though a local, breeder, and is found as far north as the "Saginaw Grand Valley."

***Passerherbulus henslowi*.** HENSLOW'S SPARROW.—In 1880 this species was listed as a "very rare summer visitor" at Ann Arbor. Our earliest specimen was taken May 26, 1894, and breeding birds were collected in the county near Manchester, June 23, 1917. The first specimen seen by the writer was a fine male found dead at Ypsilanti on April 18, 1908. Another specimen was taken on May 1, 1909, and two more were seen on May 16, in Ann Arbor. Each year since 1909 the species has increased in numbers and is now found breeding in several favorable localities. They have been reported from Eaton and Oakland Counties, the third tier of counties from the south.

***Chondestes grammacus grammacus*.** LARK SPARROW.—In 1880 this species was listed as a "rare migrant" at Ann Arbor, but the writer did not see it until April 20, 1895. Since that date several have been

noted in Washtenaw County, and it is now a rare resident all over the southern part of the state.

Spiza americana. DICKCISSEL.—This species was first observed in Washtenaw County in 1877, and again in 1903-4. On June 30, 1909, numbers were nesting in the meadows near Ann Arbor, but these were the last seen in the county. In 1899-1900 it was found breeding near Grand Rapids, in Clinton and Ionia Counties, seventy-five miles to the north. The species has now apparently withdrawn from nearly all of southern Michigan.

Vermivora pinus. BLUE-WINGED WARBLER.—This bird is a rare visitor or summer resident in southern Michigan. One was reported from Mackinac Island by S. E. White (Auk, X, 1893, p. 227). Three of the few noted in Michigan have been taken at Ann Arbor as follows: May 5, 1890, an adult male, in the writer's collection; May 1, 1896, an adult female taken by the writer; May 4, 1919, a fine adult male collected by Walter Koelz.

Protonotaria citrea. PROTHONOTARY WARBLER.—This southern species was first recorded from southwest Michigan in May, 1891 (Butler's Birds of Indiana, 1897, pp. 1922-1923). Since that date it has been found over most of the southern half of the Lower Peninsula and seems to be increasing in favorable localities. The writer first saw the nest of this species in a wet swamp about 20 miles northeast of Ann Arbor on May 8, 1896. It was not observed again until May 20, 1907, but since then it has become quite common along the Huron River, where it breeds in the swamps.

Wilsonia citrina. HOODED WARBLER.—Although Covert, 1881, says this species is "a rare summer resident" the writer can find neither the data nor the skins. Mr. Robert H. Wolcott observed it in Washtenaw County on May 13, 1887, and an immature female in the Museum collection was taken near here in 1880. The writer during fifty years of bird work in this vicinity has seen but one, an adult male found at the edge of the Huron River, near Ann Arbor, on April 7, 1912. On September 4, 1917, the writer noted both adults and young near Harbert, Berrien County, Michigan, where one was taken, August 31, 1917, by H. B. Sherman.

Opornis agilis. CONNECTICUT WARBLER.—This is another species which seems to be increasing in Michigan. On May 20 and 22, 1879, Charles Gunn recorded two (Nuttall Bull. IV, p. 186). At Ann Arbor the first one was taken by Covert, May 17, 1880. The writer's first specimen, an adult male, was taken September 9, 1896, and no others were seen in Washtenaw County until May 15 and 20, 1905. The following spring furnished the earliest spring record, May 2, 1906. In 1907 the species was observed on May 18, 30, and 31. On the last date the writer collected a pair. The last spring record for that year was June

6, when a female was seen at the "overflow," a dam on the Huron River near Ann Arbor. Other records are as follows: May 17, 1908, two seen; May 28, 1910, one seen; May 17 and September 20, 1912, one seen; May 8, 22, 23, 1913, one seen; May 25, 1918, one found dead on the University campus; September 14, 1918, one seen by A. D. Tinker. In September, 1919, Mr. Koelz found this species quite common near Alpena, Michigan; and the writer saw numbers of them along the Galien River in Berrien County the last week of May, 1918 and 1919.

Cistothorus stellaris. SHORT-BILLED MARSH WREN.—This is another species that has apparently extended its range northward in Michigan even to the south shore of Lake Superior. The writer found a colony in a wet marsh in Chippewa County in July, 1914. Local colonies occur about Ann Arbor, nesting in June in wet meadows, and more are being found each year.

Baeolophus bicolor. TUFTED TITMOUSE.—The writer's first record is October 7, 1878. On October 5, 1886, three were taken at Ann Arbor and a few have been noted at intervals since then as follows: January 1, 1898; October and December 1903, one seen by writer; March 24, 1907, one seen and a nest found by A. D. Tinker (Auk, Vol. XXV, pp. 322-323); observed January 2, 18, 26, 1916; February 4, and March 17, 1917; October 6, and 21, 1918. It is fairly common in Berrien County in southern Michigan.

GENERAL NOTES

An Oil-Soaked Loon (*Gavia immer*) at Watch Hill, R. I.—While walking along the beach at Pleasant View on July 30, 1921, I noticed a large water bird leaving the surf and hobbling up to the dry sand of the beach. In progressing the legs were of little aid, being used laterally in pushing the bird forward; the wings arched down till they acted on the sand much as crutches would with a person. Even the bill was utilized in this strange method of propulsion. First impressions were of a wounded cormorant, duck or some such waterfowl, but as we drew near, I saw that it was an immature Loon. Before we could secure it, however, back it went into the water, and diving into the nearest breaker, rapidly swam out before reappearing. Something, however, was amiss. The Loon described a large semicircle before getting very far out and returned to the beach one hundred yards or so away. Running to the spot we intercepted the bird and managed to secure a neck-hold so as to carry it to my cottage. Greasy hands soon told the story—the Loon had fallen victim to the heavy black oil that is taking such toll of marine bird-life of late

years. The bird was saturated with the oil; not a feather appeared natural, but each one was plastered down so as to be useless. After losing the first symptoms of fright, the Loon endeavored to preen its oil-soaked plumage. My wife, meanwhile, came to the rescue with several applications of lard, followed by warm rinsings. This restored the plumage to a more natural condition, the back and neck losing the dirty, greasy appearance, while the underparts came out a beautiful white. Apparently, however, it was too late. The Loon steadily failed and became weaker each hour. Its whole system seemed to be saturated with oil and the intestines gave evidence of a violent reaction. Twice we carried the bird down to the water that day, hoping it might recover in more natural surroundings. After a preliminary dive, however, the Loon would turn back to shore utterly exhausted; the breakers would practically wash it to land. The great problem was that of feeding and all of this had to be done by compulsion. As the bird grew weaker it became tamer and would allow its back to be stroked, and other handling with no attempt at fighting such as it showed at first. When we scratched its neck or back, the Loon made a little crooning noise and plainly showed its pleasure. After the second day it grew worse and died. A Wilson's Petrel was subsequently picked up on the beach with feathers similarly oil-soaked.

The changing over of many former coaling steamships and the building of the prevailing oil-driven type does not augur well for off shore birds. Nothing short of a rigid federal law relative to the disposal of waste oil at sea can save multitudes of our seabirds from destruction.—AARON C. BAGG, *Holyoke, Mass.*

Fish-catching by the Black Skimmer.—Having enjoyed the editor's privilege of reading Mr. Arthur's most interesting paper on the Black Skimmer which appears on the earlier pages of the present issue of 'The Auk,' some months before it was sent to the printer, I was naturally fully posted on the question at issue, and keen for any opportunity to watch the actions of the bird which might fall to my lot.

On July 17, 1921, while traversing the inland waterway some miles above Atlantic City, N. J., we encountered a few Skimmers one of which, skimming the surface in the ordinary way, passed between our motor boat and the black mud bank which loomed above the water at low tide marking the inner bank of the channel. The bird was not more than 35 feet distant and I caught and followed him with my binoculars. Just as he was opposite the boat he drove his bill into the water and seized a fish about three inches in length, holding it transversely between the mandibles, and flew off with it across the marsh. While this corroborates Mr. Arthur's statement as to the character of the Skimmer's food it demonstrates that it sometimes, though no doubt rarely, secures its food while skimming, a fact that had escaped his careful observation. I could think of no possible benefit to be derived by the bird from the unequal mandibles

when catching fish during flight. It was not "ploughing the main" at the time, and it would seem as if the peculiar bill must have been a hindrance to its success rather than an aid. My observation therefore in no way explains the peculiar structure of the bill but as a slight addition to Mr. Arthur's paper it seems worthy of record.—WITMER STONE, *Academy of Natural Sciences, Philadelphia*.

Laughing Gull (*Larus atricilla*) Captured by Snapping Turtle.—

While employed during the past summer on the collecting crew of the Marine Biological Laboratory at Woods Hole, Massachusetts, a very curious incident came to my attention. At the time, it did not occur to me that it was unusual, but at the suggestion of Mr. Henry W. Henshaw I am submitting this account for publication.

One morning in July, two of the collectors, Dr. H. B. Baker and Mr. Fred Erskine, while working at a fresh-water pond near Woods Hole saw a Laughing Gull (*Larus atricilla*) struggling violently in the water. It seemed as if something had caught it from below and was trying to draw it under. The men secured a boat at once and rowed out to the scene. Once, before they reached the spot, the gull was drawn completely under, but immediately came to the surface again. When the men reached it they pulled it from the water. Its captor, a large snapping turtle, with carapace nearly eighteen inches long, did not release its grip and was hauled from the water with the bird.

The abdomen of the gull was torn completely open and the viscera mangled, so the bird was immediately killed by one of the men. The dead bird and the turtle were brought to the laboratory. I had an opportunity to examine the former. It was an adult, apparently healthy, and with both wings sound. The turtle was killed and its stomach contents examined by a well-known physiologist, Dr. McCullom. No bird remains were found. Mr. Henshaw told me that it was very unusual for a gull to be caught unawares while sitting on the water unless it were diseased or injured. Such may have been the case here, but the evidence was not found. Whether or no, the vitality of the bird seems to have been very remarkable.—E. GORDON ALEXANDER, *Fayette, Mo.*

A Mating Performance of The Least Tern.—On May 27, 1921, I was puzzled by the behavior of some Least Terns (*Sterna antillarum*) at Carpinteria Beach, Santa Barbara Co., Calif., which were feeding small fish to other Terns apparently full grown. On May 31, at the mouth of the Ventura River, Ventura Co., Calif., I had an opportunity to observe the performance again at close range. It was evidently a mating performance. There were four or five pair playing about an estuary, pursuing each other and screaming. Occasionally one bird would bring up a small fish and then be joined by, or join, another bird, and after some aerial skirmishing and much screaming, both birds would alight on the

beach. The bird with the fish, which I assumed was the male, fed it to the female, and then for an instant stood with bill pointed upward, in an attitude similar to that of a mating Herring Gull.

I have been able to find no published account of this habit of the Least Tern. Mr. Harry Harris, however, has called my attention to an article in 'British Birds' (Vol. XIV, Sept., 1920) by Thomas Lewis, illustrating by photographs practically the same performance of the European *Sterna minuta*, a closely related species.—RALPH HOFFMANN, *Carpinteria, Cal.*

Brown Pelican in Oswego County, N. Y.—On December 21, 1920, there was taken at Richland, Oswego County, N. Y., an adult Brown Pelican (*Pelecanus occidentalis*) which evidently had been forced to alight because of exhaustion. The bird died on the 25th and it was not until the 27th that I was informed by the game protector that such a bird had been taken. I immediately visited Mr. Ernest V. Spink of Richland, at whose home the bird had been kept and there I learned that the Pelican was at Lacona being mounted by Mr. T. H. Elmer. The same day, I went to Lacona and saw the Pelican, which was mounted and drying. Mr. Elmer informed me that the bird was very emaciated and one leg showed an injury. The specimen was an adult in the post-breeding plumage, with the hind head and whole neck white with a tinge of straw-color. At present the specimen is in the New York State Museum at Albany, N. Y.—MILES D. PERNIE, *McGraw Hall, Cornell University, Ithaca, N. Y.*

Jaeger at Sandy Pond, Oswego County, N. Y.—On August 8, 1920, while observing shore-birds and Common Terns at the outlet of Sandy Pond into Lake Ontario I saw a Jaeger and observed it pursue the Terns for quite a period of time. I was able to watch it closely both in the air and while resting on the sand. It was in a very dark plumage or phase and showed white shafts to the primaries, giving the effect of a white patch in the wing when spread. The central tail feathers were elongated and acuminate. I was unable to collect the bird because at that time I had no collecting permit. However, from what details I could observe, I feel very sure the bird was a Parasitic Jaeger, (*Stercorarius parasiticus*), a species which has been seldom reported from the interior of New York State, and for this reason I consider the incident worthy of recording, in spite of the fact that the specimen was not taken.—MILES D. PERNIE, *McGraw Hall, Cornell University, Ithaca, N. Y.*

Double-crested Cormorant (*Phalacrocorax auritus auritus*) in Ontario.—From August 4 to 21, 1921, near Gargantua, Ont., north shore Lake Superior about 80 miles north of Sault Ste. Marie, Michigan, six of these birds were around the pound nets dily. The fishermen informed us these birds had been there since May.—M. J. MAGEE, *Sault Ste. Marie, Mich.*

Egret and Little Blue Herons at Elizabeth, N. J.—On July 31, 1921, I found three immature white Little Blue Herons (*Florida caerulea*) in the same small fresh water swamp near my home which was visited last summer by three individuals of this species as previously noted in 'The Auk.' The same day I discovered another white bird of the above species and an American Egret (*Casmerodius egretta*) feeding in a pond on the local salt marsh. On August 4 the number of Egrets had increased to nine. The marsh is supporting a good many marsh birds this summer in spite of the draining, ditching, and free use of oil by the mosquito commission. At least two Greater Yellow Legs (*Totanus melanoleucus*) remained here throughout the breeding season, also several Black Ducks (*Anas rubripes*), and one great Blue Heron (*Ardea h. herodias*), though all probably non-breeders.—CHARLES A. URNER, *Elizabeth, N. J.*

Egrets on the Potomac.—On the morning of August 4, 1921, between 8:30 a. m. and 9 a. m., while crossing the Potomac, on the highway bridge, I saw two Egrets. They were about two or three yards apart, sitting on floating logs. At first I paid very little attention to them, thinking them Gulls, but, as the car neared them, they straightened up, and I observed their long necks and legs. After sitting at attention for a few seconds they flew off, with their legs straight out behind them.

Again on the morning of the 5th, I saw the pair, and this time they flew to an island near the Virginia shore, formed several years ago, when the channel was dredged, and now covered with thick vegetation.—M. DORSEY ASHTON, *Alexandria, Va.*

Egret near Albany, N. Y.—An American Egret (*Casmerodius egretta*) was seen about thirteen miles west of Albany on August 3, 1921. The bird was feeding in company with seven or eight Great Blue Herons at the edge of the Watervliet reservoir.

We were able to observe the bird at short range with our binoculars for some time. The next day it was seen at a considerable distance, on the day following it could not be found, though those living near reported having seen it earlier in the day.

Doubtful reports have come to us from time to time of "White Cranes" in our vicinity. One is said to have visited Kinderhook Lake, about fifteen miles east of this city, last year. One is also reported to have visited the place where this Egret was seen about this same time last year, remaining for three or four days. Two are reported to have been taken within fifteen miles of the city within the last five years. These last reports are probably correct, but have not been verified as yet.—BARNARD S. BRONSON, *State College for Teachers, Albany, N. Y.*

Egrets near Schenectady, N. Y.—On Saturday, August 13, 1921, while hunting Indian relics with my wife, on the site of an old Indian vil-

lage, about two miles below Niskayuna, on the south bank of the Mohawk River, which place is situated about six or seven miles below Schenectady, we saw a pair of Egrets (*Casmerodius egretta*).

Again on Sunday, August 14, I visited Niskayuna with Mr. W. L. R. Emmet, of Schenectady, and Mr. B. S. Bronson, of Albany, and by boat we were able to get several good views of these birds, at one time approaching within 150 yards. We could distinguish quite clearly the black tarsi and the yellow beak and lores, thus thoroughly establishing identification. Upon returning to the village of Niskayuna, I was informed by the man who rents boats that two years ago two similar birds visited that region.

These aristocrats of the bird kingdom were quite exclusive, rather shy, and kept aloof from the Great Blue Herons, which are quite common in this locality. I am inclined to believe that the American Egret is not so rare a visitant to New York State as is popularly supposed.—LANGDON GIBSON, *Schenectady, N. Y.*

An Egret (*Casmerodius egretta*) on Long Island, N. Y.—At the mouth of Nissequogue River, near Smithtown, Long Island, N. Y., on July 22, 1921, I saw an Egret (*Casmerodius egretta*) flying out over the Sound and later the same day saw it alight in the marsh near by. The bird is sufficiently rare in that region to warrant recording this occurrence.—ARTHUR H. HOWELL, *Washington, D. C.*

***Aramus vociferus* and *Branta canadensis canadensis* in Florida.** On May 20, 1921, in company with H. H. Rast, the writer left Leesburg, Florida, in a motor boat, crossed Lake Griffin and descended the Ocklawaha River to the point where it empties into the St. Johns River. It required three days to make the trip. For the greater part of its length the river is bordered on both sides with a swamp often a mile or more in width. Formerly this region was noted for the large numbers of Limpkins to be found here. Various local hunters with whom I talked spoke of killing twenty or thirty of these birds in a morning. Today the species exists only in greatly reduced numbers. Eleven were seen during our trip and another called for a time one morning near our camp. Some of the birds were so tame they might easily have been shot from the boat.

Near Eureka, Marion County, on the morning of May 22, 1921, a flock of Canada Geese crossed the river. They were flying in characteristic formation and passed almost directly over us at an altitude of perhaps 100 feet, rendering the identification beyond question. Some fishermen later reported having seen one on the river the previous day. Two points of interest are attached to this observation. First, the Canada Goose is not often found in Florida, and second, the date would appear to be an unusually late one for this migratory species.—T. GILBERT PEARSON, *New York City, N. Y.*

Hudsonian Curlew and Golden Plover at Nantucket.—On May 13, 1921, my son, Capt. George H. Mackay, Jr., R. A. F., saw fourteen Hudsonian Curlew (*Numenius hudsonicus*) resting in a large field on Brant Point, Nantucket, Mass. They were very tame. This is the earliest record that I am aware of. From my earliest recollection these birds have been coming to the island, gradually diminishing in numbers until only a small remnant now returns; say some thirty birds or so. I infer that those now recorded are the progeny.

I have it on good authority that a gunner shot six young "pale-bellies", American Golden Plover (*Pluvialis dominicus dominicus*) on Nantucket about the middle of September, 1920. There were eight in the flock.—GEORGE H. MACKAY, *Nantucket, Mass.*

Occurrence of the Buff-breasted Sandpiper (*Tryngites subruficollis*) in Chicago Parks.—On April 27, 1921, it was my good fortune to observe a single individual of this species, in company with a pair of Spotted Sandpipers on the shore of the power boat harbor in Jackson Park.

On August 23, 1921, I was exploring the reclaimed land at the extreme north end of Lincoln Park, a place which seems to be a sanctuary for migrating shore birds, when I was surprised to come upon this species again. This time there were two birds and they were feeding in a grassy plain a short distance from the shore. These birds have remained and at the present writing (September 11) they are still to be seen at the same place. Since my first observation of the birds there, I have had the pleasure of pointing them out to Mr. J. D. Watson and Mr. Edward R. Ford.—GEORGE PORTER LEWIS, *4559 Forrestville Avenue, Chicago, Ill.*

Piping Plover Breeding in New Jersey.—On June 18, 1921, in the central part of the New Jersey coast, I found a pair of Piping Plover (*Charadrius melodus*) wearing an anxious mien. I retired to the top of a nearby dune and lay down in the long grass, and after a few minutes I noticed that running about with the old Plover were three fuzzy bumblebees on stilts. When I walked toward these downy chicks, they hid, but I caught one eventually, and it was about the cutest infant I have ever 'held.' No pinfeathers were visible. In scurrying over the beach before me, it held outspread its white, half-inch wings, like a running ostrich, only smaller. When caught, it was ever alert to escape, and would try to climb over my hands when I made of them a fence around it on the sand. One of its parents would run about with tail spread to the utmost and wings partly spread and quivering strongly, but if this was an attempt to play wounded and lure me away, it was not well done, for the bird kept at such a distance from me that I had to use my glass to observe clearly its attitude.

Some distance away, I met another adult Piping Plover, but it did not act as though breeding.

Dr. Witmer Stone, in his 'Birds of New Jersey' (1908) calls this species "A rare migrant, if indeed it occurs at all in the State." It may be that this occurrence indicates a coming return to our shore as a common breeding species, if unmolested. Let us give it a good chance, as it is a most charming little spirit of the sands.—CHARLES H. ROGERS, *Princeton Museum of Zoology, Princeton, N. J.*

Note on the Breeding of the Semipalmated Plover (*Aegialitis semipalmata*) in Nova Scotia.—In the October, 1920, number of 'The Auk,' on page 583, Mr. Harrison F. Lewis reports the finding of the eggs of the Semipalmated Plover and several pairs of this bird at Cook's Beach, Yarmouth County, Nova Scotia, and called attention to the fact that the third edition of the 'Check-List' states that this bird breeds south only to the Gulf of St. Lawrence. On page 597 of the same number of 'The Auk' I referred to my finding of the downy young of this plover at Seal Island off the southern point of Nova Scotia in July, 1920. In the same month on the shore of Barrington Bay near Coffinscroft, I found a Semipalmated Plover performing the wounded-bird act, showing it had young in the vicinity. On July 1, 1921, I found two pairs of this bird at Advocate, Cumberland County, Nova Scotia, whose actions pointed to their breeding at this place. It is evident, therefore, that the breeding range of the Semipalmated Plover includes Nova Scotia.—CHARLES W. TOWNSEND, M. D., 98 Pickney St., Boston.

An Unusual Dove's Nest.—While in the little town of Worthington, a suburb of Columbus, Ohio, on May 20 and 21, I observed a Mourning Dove (*Zenaidura macroura carolinensis*) setting on a nest, built on the pipe leading from the gas range, and within three feet of the range, just below and inside the window. This nest was about the height of a man's head, from the ground.

The original nest was built by a Robin early in the spring, when a rain storm blew it down. It was in rather an insecure place, being built on the top of a four-inch pipe, but the Robin immediately rebuilt the nest, and hatched out a brood of four. Immediately after hatching, the Dove took possession, and I was told by my friend, whom I was visiting, that she had been using it about ten days. This occurrence was rather unique to me. We often here see dove nests on the ground or very near it, but never in situations on the side of a residence as this was.—PETER A. BRANNON, *Montgomery, Ala.*

The Turkey Vulture in Michigan.—Occasional specimens of the Turkey Vulture (*Cathartes aura septentrionalis*) have been recorded throughout the State, though principally in the southern counties of the Lower Peninsula. Some have, however, been seen as far north as Delta

County, Upper Peninsula ('Michigan Bird Life,' W. B. Barrows, 1912, p. 255).

While trout fishing at Lovells, Crawford County, on the north branch of the Au Sable River, on May 10, 1921, Mr. W. B. Mershon saw a Buzzard flying over at such close range that the crimson of the head and neck could readily be seen. This is a sufficiently northern portion of the State to make this record of interest.—RUTHVEN DEANE, *Chicago, Ill.*

Short-eared Owl Nesting at Elizabeth, N. J.—On May 14 the writer found on the salt marsh near Elizabeth, N. J., a nest containing eight young Short-eared Owls (*Asio flammeus*). The birds showed considerable difference in size. Four had the eyes open and measured $4\frac{3}{4}$ – $5\frac{1}{4}$ inches in length as they squatted in the nest, and besides a coat of light cream or buff down they showed some feathering on the back with primary quills about an inch long. The other four measured $2\frac{3}{4}$ –3 inches, the eyes were shut and they showed only the downy coat. The four larger young were on one side of the nest, the smaller ones on the other.

The nest was at the edge of a scald or bare spot in a stretch of salt hay meadow. It was composed of but a handful or two of matted hay, in fact there seemed to be only a little more dead vegetation under the young birds than was to be found covering all the ground thereabouts. The place was foul with droppings and littered with feathers of various small birds but I found no pellets.

Two adult owls were in the vicinity, one of which I flushed ten yards from the nest and the other directly from the nest. No difference in marking to distinguish sexes was noticeable. The first bird flushed strove vainly by imitating injury and distress to draw me away, these exhibitions including sheer drops or tumbles from the air and flutterings and cries with wings outspread while on the ground. When not thus engaged the bird maintained a position directly overhead facing the wind. The second adult, when flushed from the nest, joined the vigil overhead. A third, attracted by the cries, appeared in the vicinity, but did not approach closely.

On my return on May 21 only four young, evidently the smaller ones of the previous week, remained in or near the nest. They had grown to a squatting length of about $5\frac{1}{2}$ inches. Three adults were again in evidence, two near at hand, the third appearing later at a distance. Returning on May 28 and June 4 the nest was empty except for one dead young owl and one large Pellet. One adult was flushed and its repeated simulations of injury indicated that the young were hiding in the grass nearby.

That the eight young represented two broods seems probable, but the eggs might not have been hatched in the same nest. On May 4 and 5 a heavy storm and an unusual tide flooded the greater part of this marsh. The spot where the young were found was not inundated and possibly

one or both broods, or young birds or as eggs, were carried from the flooded area by the parents to this haven of safety. This, of course, is mere conjecture.

So far as I have been able to determine this is the first nesting of the Short-eared Owl definitely recorded from northern New Jersey.—CHARLES A. URNER, *Elizabeth, N. J.*

Arkansas Kingbird (*Tyrannus verticalis*) in Maine.—Mrs. C. W. Alexander of Hallowell, Maine, wrote one of the members of the Stanton Bird Club of Lewiston, Maine, giving a description of a strange bird that she had seen, remarking that it looked like the picture of the Arkansas Kingbird. When I read in a recent 'Auk' of the appearance of this species in Massachusetts, I was able to help her identify the bird.

Following is Mrs. Alexander's account. "I got wonderful studies of the Arkansas Kingbird as it visited the yard of a friend on the next street and I saw it at close range several times, about four feet, through a window, and ten feet in the open. Head grey; back brownish grey, yellow feathers on rump but not conspicuous; wings brown, feathers edged with white making lines lengthwise on wing; tail dark brown, two outer feathers white; bill rather long, black or very dark, lower mandible reddish next to throat; throat very light gray almost white; breast buffy; belly decidedly yellow; feet and legs black. Length about nine inches. It changed plumage somewhat after its arrival. The olive tinge of the back became quite brown and the breast much duller. I could see with my glasses tiny fluffy grey feathers that obscured it and gave it a buffy appearance. It was tempted with all sorts of grain, raisins, apple, suet, and crumbs but the only food it was seen to take was the dried berries of the woodbine which it took on the wing in true flycatcher fashion. It seemed to regurgitate, for as it sat on the clothes reel, its favorite perch, it would throw something out that I was unable to find in the snow. It was reported to me about one week before I saw it on November 12, 1920. I saw it the last time January 15, 1921. On the latter occasion sleet was frozen on its tail and back and it was so benumbed that apparently it did not notice me. It disappeared that day and never returned".—CARRIE ELLA MILLER, *Lewiston, Maine.*

Blue Jay Feeding on Pecans.—During the past fall and winter, I have been very much interested in observing the Blue Jay (*Cyanocitta cristata florincola*), feeding on pecans in the yard of my residence. Within the enclosure of my back yard, is a large pecan tree, on which remain during the winter, a few pecans hardly worth gathering on account of their size, which drop off the tree during the winter months, and which form food for the Blue Jays.

I have often noted a Jay fly down into the yard, take a pecan in his claw, alight on the top of the fence, hold on to the fence with one

foot, with the pecan in the other, peck a hole in it, and where the meat cannot be pulled out, apparently suck it from the shell. This performance is often repeated until the bird secures a meal of these nut meats. We do not disturb them in this performance and apparently they frequent the premises for that purpose.—PETER A. BRANNON, *Montgomery, Ala.*

The Starling again at Cumberland, Maryland.—My friend and correspondent at Cumberland, Md., Mr. John A. Fulton, writes me that the Starlings again turned up in that city in February 28, 1921. They also followed the same tactics as last year, wheeling about the vine-covered Episcopal church, with the apparent intention of settling down in the vines, but the English Sparrows lodging there promptly went at them again and again, until the Starlings withdrew and settled down in some trees nearby. This was repeated for several days.—G. EIRIG, *Oak Park, Ill.*

Evening Grosbeak Breeding in Michigan.—For a number of years I have had a flock of Evening Grosbeaks (20 to 60) feeding at my house every winter. About the end of May the last one would disappear and none would be seen again until they reappeared the latter part of October to again spend the winter. Last spring Dr. Christofferson, my associate in bird work, and myself heard rumors that a number of Evening Grosbeaks had summered during 1920 near Munising Junction, some 115 miles west of the Soo, had been there all winter and were still there. The doctor visited the Junction June 1, 1921, and saw six of the Grosbeaks. The station agent stated the Grosbeaks had been around all the previous winter and summer. The doctor arranged with the agent to keep track of the birds this summer and again visited the Junction, September 4. He saw twenty, including a number of young birds and on September 9, eleven. The agent informed him he had kept track of the birds and they had been around all summer.

Early in July we had reports that Evening Grosbeaks were at Hulbert, some forty miles west of the Soo. July 17, 1921, the doctor and I visited that locality. We only had an hour between trains. We did not see any birds but were told by several people the Grosbeaks had been there that morning, were there almost daily and had been there all the previous winter.

August 24, while at breakfast a male Evening Grosbeak came in to one of my feeding boxes. The next day there were three males, two females, and one young in immature plumage and hardly able to fly. August 26 I saw two very young birds. There are ten or a dozen birds in the flock and they are still here September 10.—M. J. MAGEE, *Sault Ste. Marie, Mich.*

Albinism in the Sharp-tailed Sparrow (*Passerherbulus cauda-*

cutus).—A series of fifteen specimens of this species taken by me since 1900 and up to 1921 in the autumn and winter, and within 300 to 400 yards of my house, show albinism varying from one or more white feathers in the tail or wings to beautifully mottled birds with white prevailing on the head and back; very few white feathers, however, are present on the under parts and, in most cases, are absent.

All of these specimens, which are now in my collection, are spotted with blackish in the abdominal and ventral regions, the specimens showing the most white in the normal feathers have invariably the most black spots while in those that show only one or two white feathers in the tail or wings the spots of black are reduced to a minimum. Several specimens have the tail feathers and dorsal feathers greatly lengthened with an appendage-like feathering and which I have only found in this species.

An albinistic Seaside Sparrow (*Passerherbulus maritimus maritimus*) taken by me on November 11, 1915, and at the same locality, has the black spotting confined to the sides, only, the abdominal and ventral region being white and without any spotting as is invariably not the case of the Sharp-tailed Sparrows that show albinism.

This strain of albinism in the Sharp-tailed Sparrow has held uninterruptedly year after year on this little realm, which embraces only a few acres of high land, to which large numbers of birds such as the Sharp-tailed, Acadian, Nelson's, Seaside, and a few Macgillivray's Seaside Sparrow repair at high water or principally at the advent of spring tides, and where I have seen in a single season no less than three albinistic Sharp-tailed Sparrows.

Since 1900 I have taken about twenty-five Sharp-tailed Sparrows on this little piece of land, all of which showed albinism in a greater or lesser degree, and all taken exhibited the black spots on the abdomen. On February 12, 1918, I picked up a pure white mummified Sharp-tailed Sparrow on "Eagle Island," which is about two and a half miles from my house. This bird without doubt succumbed to the intensely cold weather that prevailed in January, and is the only perfect albino I have ever seen.
—ARTHUR T. WAYNE, Mount Pleasant, S. C.

The English Sparrow and the Motor Vehicle.—In 'The Auk' for April, Dr. W. H. Bergtold has recorded an interesting chapter in the history of the English Sparrow, which might forecast a much to be desired reduction in the ranks of that pest. From the observations I have recently made in eastern Oregon, I am not at all sure that there is any real reduction.

It is generally conceded that the empty grain cars have been the chief means of distributing this species, which has until late years confined its habitat to the cities or the more densely populated sections adjacent.

So closely did the species adhere to the lines of the railways that many of us began to think that farming sections, of the west at least, might be

spared its visitation. If such was the condition a few years ago it surely is not true today, as a trip through the sage brush sections of eastern Oregon will prove.

Some ten years ago I noted an English Sparrow about ten miles south of Vale, Oregon. At the time this was so far from the usual range of the bird that I made note of the case. The species was very abundant in Vale, but none were seen even a mile from the streets. A year or two later they were to be found among the ranches, as far as Ironside, some fifty miles from Vale and half that distance from the railroads. Within two years they were abundant about every barn in the Ironside section, except where they were driven away by use of the shot gun.

In late May, of this year, I drove by auto from Vale to San Diego, via Burns, Oregon. Burns is some 100 from the nearest railroad and the ranches between are few and widely scattered. English Sparrows were seen by thousands in Burns, and to get there they must have passed over many miles of sage brush and barren hills, where no human habitation offered food or shelter. Without doubt the species is becoming rapidly a resident of the ranch lands of Eastern Oregon. It would be interesting to learn to what extent it is abandoning the city for country life, whether the reduction in its ranks in Denver is due to fewer birds or merely a moving to the rural sections. The reasons given by Dr. Bergtold, for the decrease in the numbers in Denver, are very logical and, I think may be duplicated in most of our cities. How about the adjacent farms?—A. W. ANTHONY, *Natural History Museum, Balboa Park, San Diego, Calif.*

Goldfinches and Purple Finches Wintering at Hatley, Stanstead County, Quebec.—For the second time in the past eleven years Goldfinches (*Astragalinus tristis tristis*) have again spent the winter here (1920-21), and Purple Finches (*Carpodacus purpureus purpureus*) have likewise done the same thing, this however being the first occasion of their doing so during the above period, the previous occasion of the Goldfinches being in 1915-16. It may not be generally known that the Purple Finch is much addicted to eating salt, which accounts for its almost constant appearance in my garden of late years, there being a small trough just outside the fence where my landlord keeps salt for his cattle. It had puzzled me for some time why the birds were so fond of this particular spot until I read in 'Bird-Lore,' Vol. XXII, 1920, p. 286, of House Finches (*Carpodacus mexicanus frontalis*) being addicted to this same habit, when the mystery was solved. It has also been recorded in the same magazine for March-April, 1921, pp. 90-91, how English Sparrows, Mourning Doves, Crows and some other common birds have been seen round a trough in a pasture apparently picking up grains of salt. Chickens are also said to eat it greedily.—H. MOUSLEY, *Halley, Que.*

Nonpareil (*Passerina ciris*) in Pennsylvania.—On May 16, 1921,

three miles due south of Mercersburg, Pa., on a country lane, I positively identified a male Nonpareil, in full plumage. The bird was first seen in a hedge of osage orange; thence it flew to a locust tree, where it was carefully observed. It behaved and looked like a wild bird and not like one that had escaped from captivity. With the Painted Bunting I have been familiar since boyhood, when I used to know it well at my home on the South Carolina coast.—ARCHIBALD RUTLEDGE, *Mercersburg, Pa.*

The Philadelphia Vireo (*Vireosylva philadelphica*) in the Province of Quebec.—At the conclusion of his interesting paper in the April 'Auk' on the breeding of this species at Bergerville near Quebec, Mr. Harrison F. Lewis remarks that he has only been able to find two records of the bird's occurrence in the Province, both of which date back many years ago. May I be allowed to draw the attention of Mr. Lewis as well as that of other readers to the fact that at least nine examples have been recorded by me at Hatley, during the past few years, one on August 23, 1918, and eight during September and October, 1919. Out of these latter, two were obtained, one going to the Victoria Memorial Museum at Ottawa, the other still being in my possession, see 'Auk' Vol. XXXVI, 1919, p. 486, and 'Auk', Vol. XXXVIII, 1921, p. 53. Last year (1920) I did not see a single example either during the spring or fall migration. It will be noticed that with one exception all the birds seen by me were in the fall of 1919, the year they bred at Bergerville.—H. MOUSLEY, *Halley, Que.*

Golden-winged Warbler at Sault Ste. Marie, Mich.—On September 4, 1921, at West Neebish, St. Mary's River about twenty miles southeast of Sault Ste. Marie, Michigan, I saw a male Golden-winged Warbler (*Vermivora chrysoptera*), the first I have ever seen in the Upper Peninsula of Michigan. I believe this to be the most northern record for this warbler in Michigan, certainly for the eastern portion.—M. J. MAGEE, *Sault Ste. Marie, Mich.*

Golden-winged Warbler in Kansas.—On May 2, 1921, I collected a female Golden-Winged Warbler (*Vermivora chrysoptera*). It was taken in the lower trees of some dense woods along Wakarusa Creek, in Douglas County, Kansas. The specimen is preserved in the Kansas University Museum.—E. RAYMOND HALL, *Haskell Institute, Lawrence, Kansas.*

The Kentucky Warbler in Clarendon County, South Carolina.—Although the Kentucky Warbler (*Oporornis formosa*) is fairly common during the summer near Summerton, South Carolina, it was not until last year (1920) that I found evidence of its breeding. The earliest date that I have for its arrival in the spring is April 28, 1909, but I am unable to say how long it remains in the fall.

This warbler inhabits the heavily-timbered swamps. Its movements on the ground are quick and graceful and much resemble those of Swainson's Warbler. It is a persistent singer and its song so closely resembles the "ter-weet" chant of the Carolina Wren that a novice could easily mistake it.

On June 29, 1920, I was doing field work on the edge of a large swamp, two miles from my home. Among the oak and hickory trees that bordered the denser growth, a Kentucky Warbler was heard singing. He was among the lower branches of a poplar, about twenty feet up. A little further on the female was encountered: her nervousness and incessant chipping arousing my suspicions I watched her closely. She soon emerged from the grass with a worm and took it to an oak sprout, under which was a young bird, just able to fly. He had been only a short time out of the nest.

During the present year I did not visit any swamps until May 17, when a male was heard singing. On May 27 in another swamp, a young bird was seen, which was unable to fly: I caught and examined him. In the meanwhile the female trailed over the leaves, feigning a broken wing, and came within a foot or two of me. The male kept some distance away.

On June 10, 1921, a nest with four young was found. It was a quarter of a mile from the spot where I saw the young bird on May 27, and in the same swamp, near the stream which flowed through the swamp, I heard the loud, sharp clipping of *formosa*. Both birds had food in their bills. I retreated a short distance and quietly watched them. The female almost at once flew down to the base of a sapling and came up empty handed, so to speak. The male, more suspicious, perched on a low branch, twisting about and chipping. Not until the female came again with food did he muster courage to drop to the nest.

This nest was set flatly on the damp ground, at the base of a little sweet gum bush, and no attempt was made to conceal it; built of leaves with the stems pointing outward; lined with pine needles and black, hairlike fibers. The eyes of the young birds were just opening. This nest I now have in my collection.

Little seems to be known of this bird in South Carolina though it has been recorded as nesting in the counties of Greenville, Pickens, and Aiken. Mr. A. T. Wayne, the well-known authority, who resides at Mt. Pleasant, South Carolina, informs me that the Kentucky Warbler does not breed anywhere on the coast of the State. It is an uncommon bird in spring, he says, and most of his records are fall ones.

In view of the fact that all of my records were made in a limited area, this bird should prove to be, upon further search, a plentiful species as well as a common breeder.—E. VON S. DINGLE, *Summerton, S. C.*

Mockingbird and Catbird Wintering at Cumberland, Maryland.

—Mr. John A. Fulton of Cumberland, a very capable observer, writes me that on January 23, 1921, he heard and saw a Catbird in a thicket near the city, and that a Mockingbird wintered in the shrubbery around a residence in "The Dingle," an outlying residence district of the city.—G. EFRIG, Oak Park, Ill.

Early Spring Records at Hatley, Stanstead County, Que.—I suppose the very early and abnormal spring of 1921 has been the means of creating innumerable ornithological, as well as entomological and botanical records. Most of the early wild flowers are at least a fortnight in advance of previous years, and amongst the birds the following are ahead of any previous records during the past eleven years, viz.: Bittern (13 days), Wilson's Snipe (14), Red-shouldered Hawk (10), Belted Kingfisher (5), Ruby-throated Hummingbird (7), Rusty Blackbird (12), White-throated Sparrow (6), Cliff Swallow (8), Black and White Warbler (4), Black-throated Blue Warbler (2), Ruby-crowned Kinglet (6), Bluebird (8). At the time of writing (May 14) the real warbler wave has not yet set in, the only species present being males of the Black and White, Black-throated Blue, Myrtle, and Black-throated Green.—H. MOUSLEY, Hatley, Que.

Unusual Winter Occurrences at Chicago.—The last unusually mild winter (1920-21) had some curious effects on the movements of several species of birds. There was an invasion of the Arctic Three-toed Woodpecker (*Picoides arcticus*) if the seeing and reporting of about fifteen specimens may be so termed. They appeared in October, despite the warmth of this month, and were seen in many places in and about the city. I saw three in one day at Millers, Indiana, in the dunes, on November 26, 1920. The previous winters we had the Bohemian Waxwing, the Evening Grosbeak, both in numbers, the Pine Grosbeak, the Crossbills, and the Redpolls, and now the Three-toed Woodpecker. We must be getting an arctic reputation among the birds up north.

A belated Lincoln's Sparrow was secured by Mr. S. S. Gregory at Beach near Waukegan, on December 26, 1920.

At the same place a Black-crowned Night Heron in immature plumage was shot on January 4, 1921.

Harris's Sparrow (*Zonotrichia querula*) seems to be shifting its migration routes farther east, at least it is seen more often of late. Mr. H. L. Stoddard saw one in Jackson Park in September, and took several in the Sand Dunes, Lake County, Indiana.

A shifting of breeding range northward, probably owing to the mildness of the winter, seems to have occurred in the case of the Tufted Titmouse, at River Forest. About eight of them came into Thatcher's Woods there, during the winter, and in April were seen inspecting holes in the trees.

On May 11, 1921, a Red-bellied Woodpecker (*Centurus carolinus*) was seen in the same wood and was noted by several observers for about a week. This and one last year, seen at Addison, are the only ones I ever observed here.

A Mockingbird (*Mimus p. polyglottos*) stayed about my house all day on May 21, 1921. Several more were reported at the same time from the neighborhood. This is the second one I have seen during my twelve years' residence in northern Illinois.—G. EFRIG, Oak Park, Ill.

Additional Notes on Arkansas Birds.—Since writing my paper on the 'Birds of South-eastern Arkansas' (Auk, July, 1921), I spent two weeks—September 24 to October 8, 1920, at Chicot, Chicot County, and while there observed several species not listed before which it might be well to mention here. Chicot is the southeasternmost county of Arkansas and the character of the country is similar to that of Deshea and Drew Counties. At this season the cotton was being picked and ginned and during the first week of my stay the temperature ranged around 100° F. to 110° F.

The Mockingbirds were ever the persistent singers even during the noon-tide, under this blazing sun, and the Carolina Wrens sang in spite of the heat. On October 3 the weather turned cool and from then on was delightful.

Migrating warblers thronged the cypresses along the Bayou Mason. I listed the Tennessee Warbler (one im. collected September 26); Black and White Warbler (one collected September 25); Redstart (one collected September 26); Magnolia Warbler (one im. collected September 26); Blackburnian Warbler (October 4); and Black-throated Green Warbler (October 4).

Turkey Buzzards and Black Vultures were abundant and Red-shouldered Hawks were common. The Barred Owl, Great Horned Owl, and Screech Owl were heard calling. One Black-crowned Night Heron was heard; the Green Heron was seen along the Bayou Mason and one small white heron which I failed to identify. I was told of a swamp west of Chicot, along the Bayou Bartholomew where more White Herons or "cranes"—some with plumes and some without plumes—are said to nest than at any other point north of Louisiana. I was really surprised at not seeing numbers of White Herons during my stay but one of our men who had spent the whole year in this section told me that he never saw one although he is familiar with these birds in Florida.

The Bald Eagle is said to have nested recently near Lake Chicot. The Anhinga is said to spend the winter on Grand Lake and the White Pelican has been seen there.

Catbirds were common during my stay and numbers of Yellow-billed Cuckoos were seen. Crows were fairly common; several Kingbirds and Acadian Flycatchers were noted; also the Wood Thrush and Bluebird

were about in numbers but the Robin was conspicuous by its total absence.—CHRESWELL J. HUNT, 5847 W. Superior St., Chicago, Ill.

Early Bird Banding.—It may be of interest even at this late date to know that at Carberry, Man., in Dec., 1882, and Jan. and Feb., 1883, I marked a dozen or more Snowbirds with a black spot of printer's ink on the breast and let them go. Hoping to find out whether the species was continually migrant in the winter, or whether the same individuals stayed about our barnyard throughout the blizzard time. As I never saw any of them again I suppose they kept moving on.

On May 21, 1883, at Carberry, Manitoba, I caught a male Sparrow Hawk and let it go with a microscopic locket on its neck, in which was a note asking the finder to communicate with me. On July 8 I similarly tagged a young Robin. I wonder if any reader chanced to run across one of these.—ERNEST THOMPSON SETON, Greenwich, Conn.

RECENT LITERATURE

Chapman on Bird Life in the Urubamba Valley, Peru.¹—The basis of the present paper is a collection of birds made by Edmund Heller as naturalist of the expedition of Yale University and the National Geographic Society under the direction of Prof. Hiram Bingham, supplemented by a collection made by Dr. Chapman and Mr. Geo. K. Cherrie, July 1-24, 1916, and material obtained later for the American Museum by Harry Watkins.

Dr. Chapman's short visit to the region was made as a side trip on a more extended tour of South America, for the purpose of gaining a personal knowledge of the region visited by Heller, whose collection he had been asked to describe. His report, he states, is primarily a contribution to a biological survey of the Andean system, more especially a comparative study of the origin of the bird life of the Temperate and Puna Zones, being thus a continuation of the investigation so ably begun in his well known 'Distribution of Bird Life in Colombia.' His conclusions are that the Tropical, Subtropical and Temperate Zones of the Urubamba district are essentially the same as the corresponding zones in Colombia, and inhabited by much the same species, but that the Puna (Paramo) Zone

¹ The Distribution of Bird Life in the Urubamba Valley of Peru—A Report on the Birds Collected by the Yale University-National Geographic Society's Expeditions. By Frank M. Chapman of the American Museum of Natural History. Bulletin 117, U. S. Nat. Museum. Washington, 1921, pp. 1-138; pls. 1-9.

of Peru being much more extensive and much closer to the Patagonian sea level fauna from which its fauna is derived presents a marked difference in character.

Interesting lists of species of the several zones have been prepared showing the distribution of both genera and species. From these we see that 57 per cent of the species of the Puna Zone are endemic as compared with 80 per cent of those of the Temperate Zone. The difference, as Dr. Chapman points out, is probably due to the greater differentiation in the life of the latter Zone, which was evidently derived from the Tropical Zone and has probably passed through a Subtropical stage, whereas the life of the Puna Zone is but slightly differentiated from the South Temperate of Patagonia.

The introductory pages contain also full descriptions of the various localities visited with excellent illustrations from photographs.

The list includes all species reported from the Urubamba Valley, 380 in number, with annotations on those represented in the collections studied by the author. Thirteen new species and subspecies obtained by the expeditions have already been described by Dr. Chapman and in the present paper he proposes three others *Aratinga mitrata alticola* (p. 62), *Siptornis modesta proxima* (p. 83), and *Ochthoeca lessoni tectricialis* (p. 88).

The paper forms another valuable contribution to Neotropical ornithology the problems of which are being rapidly elucidated by Dr. Chapman's researches. In closing our review we cannot refrain from quoting a paragraph which reflects so admirably upon the present day craze for new genera and the desire of many writers, who know nothing about the questions involved to be "up to the minute" in their nomenclature! Dr. Chapman says: "Generic subdivision in ornithology nowadays is so unstandardized and in many cases is so largely a matter of opinion, that it seems unwise to change long-established terms until opportunity has been afforded to weight the evidence on which the new or revived genera in question are recognized."—W. S.

Wollaston's 'Life of Alfred Newton.'¹—To the average ornithologist the name of Newton is at once associated with the 'Dictionary of Birds' and those who make use of this work as they should, cannot but be impressed not only by the profound knowledge of birds and their literature, which the author possessed, but by his mastery of the English language, which enabled him to embody such a wealth of information in such a relatively small space. Newton is also known through his 'Ootheca Wolleyana', another masterly piece of English composition and reservoir

¹ A Life of Alfred Newton, Professor of Comparative Anatomy, Cambridge University, 1866-1907. By A. F. R. Wollaston, with a Preface by Sir Archibald Gelkie, O. M., with illustrations. London, John Murray, Albemarle Street, W. 1921, pp. i-xiv. + 1-132. Price 18 shillings.

of information on the breeding of Palaearctic birds, published as a memorial to his friend and colleague, John Wooley, and also as a contribution to the study of birds' eggs, a branch of ornithology to which a large part of Newton's life had been devoted.

To British ornithologists Newton's name will ever be associated with the B. O. U. of which he was one of the founders—if not *the* founder since the original meeting was held in his rooms at Cambridge.

It is fitting that a man of Newton's eminence in his chosen field should be properly memorialized and the recent volume by one of his former students, Mr. A. F. R. Wollaston, places on record, in a satisfactory manner, the main events of his life and gives a clear idea of his character and personality. In style the biography is perhaps not all that we might desire, since the subject matter seems to be rather carelessly thrown together and lacks continuity, so that the charm that many biographies possess in their well sustained narrative is to some extent lost. This is due in large measure to the long delay and interruptions in preparing the volume, to which the author was compelled to submit through force of circumstances, and to the final necessity of cutting down his manuscript to about one half of its original length.

Alfred Newton, we learn, was born on June 11, 1829, the son of a Norfolk squire, and was educated at Cambridge University, where in after years he became Professor of Zoology and Comparative Anatomy. He obtained a travelling scholarship at the University which enabled him to gratify his great ambition to travel in Lapland and Iceland to investigate the breeding habits of the birds of these northern countries, while later he visited the West Indies and the United States, in pursuit of bird lore and birds' eggs. In early life he suffered an accident which left him lame and this led later to another mishap which aggravated his affliction, but in spite of all he continued his active life bearing with remarkable fortitude the great handicap that had been placed upon him. He had the qualifications of a great explorer and had it not been for his affliction would undoubtedly have made a name for himself in this field.

Between Newton and his brother Edward there existed the deepest affection which stands forth as one of the beautiful features of his life. Their interests were largely identical and when separated they wrote to one another every day, or by ever mail when one of them happened to be out of the country.

Newton's conservatism is evident in everything connected with his life—his views upon most subjects, his personal habits, attire, etc., but curiously enough we find him among the first to adopt the ideas of Darwin and Wallace on evolution and one of their staunch supporters in the stormy discussions which rent the British Association in the early sixties.

Newton was dearly loved by those who came into personal contact with him at Cambridge and his kindness to young ornithologists extended

far beyond the confines of the University town, or even the boundaries of Great Britain, as the present writer can testify.

Sir Archibald Geike in a preface to Mr. Wollaston's biography sums up Newton's character as follows: "His perennial bonhommie, his youthful enthusiasms maintained up to the last, his inexhaustible fund of anecdote and reminiscence, his unfailing good humor, his love of work, and his generous co-operation in the doings of every fellow-worker who needed his help, together with the amusing predicaments in which his conversation sometimes placed him combined to make a rare and delightful personality;" and the author closing his personal estimate of the man says: "When once you were a friend of Newton's you were always his friend. He was possessed of the old-fashioned courtesy of manner, and a certain leisuredness of habit, which made a visitor feel that he was not trespassing upon the time of his host. Both in appearance and in character he had the finest attributes of the old race of English country gentleman, to which by birth he belonged."

Newton's name and influence are indelibly impressed upon the history of ornithology and present day students of his favorite science will do well to read carefully the volume which Mr. Wollaston has brought together as they are bound to gain inspiration from the history of the life that is there set forth.—W. S.

Stresemann, on the Woodpeckers of Sumatra.¹—The various Sumatran species are considered in relation to the forms inhabiting Malacca, Java, and Borneo, etc., and the applicability of Steere's law is discussed. Under each species are paragraphs dealing with distribution biology and differentiation into races; then under the Sumatran race of the species are discussed, its characters; sexual differences; plumage of the young; distribution; biology; and observations.

The following new forms are described *Picus vittatus limitans*, (p. 74), East Xangean; *Collophus miniatus dayok* (p. 82), West Borneo; and *Dinopium javanense palmarum* (p. 93) Sumatra.

At the close of the paper there is a summary of the author's detailed study, under the following headings: zoogeographic consideration, geographic variation in color, ontogeny of coloration and sexual dimorphism, molt and number of eggs. The paper is admirably planned and data of much interest and importance are presented.—W. S.

Rothschild, on Birds of Yunnan.²—A collection made by George Forrest for Col. Stephenson Clarke, contains representations of 278 of

¹ Die Spechte der Insel Sumatra. Eine monographische Studie. von Dr. E. Stresemann. Archiv. f. Naturg., 87, abt. A., Heft 7. June, 1921, pp. 64-120.

² On a collection of Birds from West-central and North-western Yunnan. By Lord Rothschild, Novit. Zool., XXVIII, May, 1921, pp. 14-67.

the 496 species of birds known from Yunnan. Twenty forms are here described as new, a few of them being from other localities or other collections.—W. S.

Hartert on the Birds of Capt. Buchanan's Expedition to Air.¹—

The collection here described is of absorbing interest as not a single specimen had previously been collected in this mountainous region of the central Sahara. They prove that the bird fauna of the region is tropical and it is now possible to fix the boundary between the palaearctic and tropical African fauna at approximately the 20th degree of north latitude. In discussing this question Dr. Hartert points out the fact that the origin of a species has nothing to do with its value in determining geographic relationships of faunas, where its present day distribution is the important point. This has been misunderstood by more than one writer.

The author contributes a most interesting preface referring to his early realization of the importance of exploring the Air district and the long delay in its accomplishment. Then follows a well annotated list of the 167 species and subspecies obtained by Capt. Buchanan's expedition, 13 of which are described as new.

A number of excellent illustrations give one a good idea of the appearance of this interesting region.—W. S.

McGregor on Birds of Panay.²—Mr. McGregor in this paper describes a trip to Antique Province on the western side of the island of Panay, P. I., undertaken in 1918. Eighty-eight species were seen or secured, of which eighteen seem to be new to the island. There are numerous annotations of interest regarding the habits or relationship of the species.—W. S.

Murphy on the Seacoast of Peru.³—Dr. Murphy's sixth paper on his Peruvian expedition treats of a visit to the island of San Gallan. It is graphically written and is particularly interesting to the ornithologist, on account of the references to the Condor and the numerous illustrations of this noble bird in flight as caught by the camera.—W. S.

¹ The Birds Collected by Capt. Angus Buchanan during his Journey from Kano to Air or Asben. By Dr. Ernst Hartert. *Novit. Zool.* XXVIII, May, 1921, pp. 78-141.

² Birds of Antique Province, Panay, Philippine Islands. By Richard C. McGregor. *The Philippine Journal of Science*, 18, No. 5, May, 1921.

³ The Seacoast and Islands of Peru. By Robert Cushman Murphy. VI. San Gallan. *The Brooklyn Museum Quarterly*. July, 1921, pp. 91-105.

Over and Thoms on the Birds of South Dakota.¹—This well printed bulletin consists of two parts the first dealing with "Bird Study" and the second consisting of a list of the birds of the state with brief descriptions, while there are numerous excellent illustrations of birds and nests, from photographs from life.

Part I, contains brief and for the most part reliable data on various phases of economic ornithology, protective coloration, molt, and migration covering such questions as are likely to occur to the beginner. The explanation of seasonal changes of plumage on the grounds of protective coloration however does not seem satisfactory and the intimation that the male Goldfinch changes color in spring without a molt is contrary to the evidence furnished us by almost every museum collection. The list includes 322 species and subspecies and seems to have been carefully compiled, while doubtful specimens have been determined by the U. S. Biological Survey. The authors are to be congratulated upon their work which cannot help but fill a widely felt want and will lead many a would-be bird student to a better knowledge of ornithology.

It is regrettable that such an excellent bulletin should be marred by such a carelessly prepared bibliography. There is no uniformity in the citation of the papers and books, and from the information given it would be absolutely impossible to find many of them. "U. S. Geological Survey," and "State Game and Fish Com. Minneapolis" are not very definite references for one seeking certain publications.—W. S.

Dwight and Griscom on *Atlapetes gutturalis*.²—A careful study of much fresh material from Central America shows that five races of *Atlapetes gutturalis* are recognizable, three of which are here named for the first time: *A. g. parvirostris* (p. 3) from the Highlands of Costa Rica; *A. g. fuscipygius* (p. 3) from north central Nicaragua and *A. g. griseipectus* from Central Guatemala. The authors call attention to the fact that in old skins of this species, the color turns brown as in certain others already referred to by Dr. Chapman, so that they are useless for subspecific comparison.—W. S.

Witherby's 'Handbook of British Birds.'³—The eleventh part of Mr. Witherby's book completes the raptores, and covers the storks, ibises, herons, swans and geese. There is an excellent colored plate of the bills

¹ Birds of South Dakota. By William H. Over and Craig S. Thoms. Bulletin 9. South Dakota Geol. and Nat. Hist. Survey. Series XXI, No. 9. March 1921. Bulletin Univ. of South Dakota. pp. 1-142. Many half-tones and colored frontispiece of Meadowlark.

² A Revision of *Atlapetes gutturalis* with Descriptions of Three New Races. By Jonathan Dwight and Ludlow Griscom, American Museum Novitates. No. 16, pp. 1-4, Sept. 9, 1921.

³ A Practical Handbook of British Birds. Edited by H. F. Witherby Part XI. pp. 177-256. July 18, 1921. Price 4s. 6d. net per Part.

of the last two groups, and the usual pertinent text figures, including interesting diagrammatic sketches of the vultures in flight as viewed from below. While the nomenclature is in the main in accord with that of the A. O. U. 'Check-List' we notice that the egrets are all referred to *Egretta* and the swans to *Cygnus*, a treatment which we would heartily endorse. The snow geese are united with *Anser*, with perhaps less warrant, and the validity of *Anser albifrons gambeli* and *Branta bernicla glaucogaster* are questioned.—W. S.

California Hawks: How to identify them.¹—This is a commendable attempt by Dr. H. C. Bryant to make possible the field identification of hawks by the average citizen. One key is given which is based on mode of flight, habits and general appearance, illustrated by outlines of flying birds of the four principal groups of hawks, and another, taking into account size and general coloration. The habits and economic value of hawks are concisely discussed with a modicum of illustration from California instances. The page of bibliography given will enable those so desiring to pursue the subject further. It is to be hoped that wide distribution of separates of this paper can be secured, and similar publications are much needed in all States. The general antipathy to hawks seems almost ineradicable, witness the fact that today bounties on these birds are specifically authorized in five of the States of the Union and may be paid in as many more.² Under the circumstances the more truth disseminated about these birds, the better.—W. L. M.

The Ornithological Journals.

Bird-Lore. XXIII, No. 4. July-August, 1921.

The Yellow-breasted Chat and the Cowbird. By Wilbur F. Smith.—Describes a nest in which two young Cowbirds were raised by a pair of Chats. Usually Chats are supposed to desert a nest if a Cowbird's egg is deposited in it. The author voices the general condemnation of the Cowbird. Its peculiar parasitism is however one of the provisions of nature and why mankind should be expected to interfere in such cases is not quite clear. It would seem to be quite as cruel to kill a young Cowbird as a young Warbler or Sparrow.

The Mockingbird of the Arnold Arboretum. By C. H. Early.—Carries the history of this notable bird so fully described by the late Horace W. Wright (Auk, July, 1921) on for another year.

The Bird Bath in Molting Time. By Craig S. Thoms.—Considers an abundance of water a necessity at this time in the bird's life. A number of interesting photographs are presented.

¹ Calif. Fish and Game, Vol. 7, No. 3, July, 1921, pp. 133-147, figs. 42-49.
² colored plates.

² See Farmers' Bull. 1238, Sept., 1921.

The Cowbird: A Parasite. By Harry E. Elder.—A valuable contribution to the history of the species and another call to upset nature's balance and destroy him.

The migration and plumage papers deal with the Grackles.

The Condor. XXIII, No. 4. July-August, 1921.

The Storage of Acorns by the California Woodpecker. By Henry W. Henshaw.—An interesting supplement to Prof. Ritter's paper in the January-February issue while the similar habit in the Red-head is also discussed.

The Storage of Almonds by the California Woodpecker. By Claude Gignoux.—A further contribution to the same subject.

The Flock Behavior of the Coast Bush-Tit. By R. C. Miller.

Genera and Species. By Richard C. McGregor.—Endorses views of W. Stone in 'Science.'

A Synopsis of California's Fossil Birds. By Loye Miller.

The Oologist. XXXVIII, No. 7. July 1, 1921.

Along the Mason and Dixon Line. By Gerard A. Abbott.—Breeding Birds about Louisville, Ky. The nesting of the Mourning Warbler in this Carolinian locality described in some detail must surely be based upon a misidentification of the nest. The bird, a notably late migrant, could easily have been present where some other species was nesting.

Carquinez Straits, California, Notes. By E. A. Stoner.

Notes on Birds Observed in Lowndes Co., Ala. By P. A. Brannon.

The Ibis. (II Series.) III, No. 3. July, 1921.

Field Notes on the Birds of Lower Egypt. By W. Raw. (continued)

First Impressions of Tunisia and Algeria. By D. A. Bannerman—One of those admirable narrative accounts of the country and its bird life which mean so much more to the reader than the ordinary "annotated list."

Notes on the Birds of Alderney. By W. R. Thompson.

Notes on Birds in South Russia. By J. N. Kennedy.

On the Correct Name of D'Aubenton's "*Manucode a Bouquets*." By Lord Rothschild.—*Diphyllodes magnifica* (Pennant), 1781, is correct.

Results of a Study of Bird Migration by the Marking Method. By A. Landsborough Thomson.—An account of the results of the Aberdeen University Bird Migration Inquiry which began in 1909, with a detailed analysis of the records of nine species and shorter reports on a number of others. There is also included an historical survey of bird-marking.

Some Thoughts on Subspecies and Evolution. By Col. R. Meinertzhagen.—An excellent explanation of the origin and nature of subspecies. The author believes that intergradation (i. e. geographic) is not necessary to constitute a form or subspecies since certain island birds are "obviously"

only geographic races (i. e. subspecies). It might be added that it is to cover just such cases that Americans, at least, admit intergradation by overlapping of characters. He also believes that subspecies are produced by the effect of environment and will when isolated eventually become species. He cites in his discussion Beebe's experiments with doves to show the instability of subspecific color characters but overlooks Prof. Sumner's experiments with *Peromyscus* pointing to the permanency of such characters in these mice, a point that would have strengthened his position. In all of his conclusions we heartily agree.

There are obituary notices of Col. H. Wardlaw Ramsay, H. M. Upshur and John Burroughs.

Bulletin of the British Ornithologists' Club. CCLXI July 5, 1921

A number of new forms of African birds and one from Burma are described.

Lord Rothschild describes a new Bird of Paradise, *Paradisaea apoda subintermedia* (p. 138) exact range not known, making seven races of the species *apoda* as he understands them. Dr. Percy R. Lowe, describes *Oceanites gracilis galapagoensis* (p. 140), from Charles Island, Galapagoes and *Puffinus puffinus mauritanicus* (p. 140), from Algeria.

An account of the ninth oological dinner is appended.

British Birds. XV, No. 2. July 1, 1921.

A Ringed Plover's "Nests." By T. Leslie Smith.—Remarkable photographs of the bird dogging a new nest and rolling the eggs into it when the drifting sand has covered the original nest.

Diving Ducks. Some Notes on their Habits and Courtship. By Charles E. Alford.—Interesting observations in western Canada.

Manx Ornithological Notes, 1920. By P. G. Ralfe.

British Birds. XV, No. 3. August 1, 1921.

Notes on the Little Tern and Young. By J. N. Douglas Smith.—An illustrated account of the breeding habits of the species.

British Birds. XV, No. 4. September 1, 1921.

Some Breeding Habits of the Sparrow Hawk. III. By J. Howen. Varieties of the Common Gannet. By Henry Balfour.—An albino and one with black eyes.

The Avicultural Magazine. XII, No. 8. August, 1921.

Birds in the Park at Cleres. By J. Delacour.

Both this and the July issue contain many notes on various birds in captivity, including *Hapaloderma narina*, *Spizixus canifrons*, *Sturnia nemoricola*, *Tarsiger stellatus*, etc.

The Emu. XXI, Part I. July, 1921.

Notes on Two New Birds. By A. H. Chisholm.—*Atrichornis* and *Pachycephala olivacea macphersonianus*.

The Satin Plover Bird.—Some Observations. By E. Nubling.—Description and photographs of the bower.

The Genus *Climacteris*. By F. E. Howe.—Critical review of the species and subspecies with notes on their habits, etc.

A South Coastal Selborne. By H. V. Edwards.—An area of four miles square under observation for six years yields 162 species. This is considered a rather large number for so small a tract but it could be exceeded at almost any locality in the eastern United States.

Variations in the Black-backed Magpie (*Gymnorhina tibicen*). By C. F. Coie.

There is also a note on the actions of the Mallee Fowl in captivity. A temperature of 85 to 96 was found to be necessary to hatch the eggs in the mound.

Another note is accompanied by a photograph showing a tree toad devouring a small bird.

'The Emu' with this issue takes on a new "plumage" appearing in a pale blue-green cover ornamented with a half-tone of the bird whose name it bears.

The South Australian Ornithologist. VI, Part 3. July 1, 1921.

Contains numerous local notes and the proceedings of the South Australian Ornithological Society.

The Austral Avian Record. IV, No. 6. August 1, 1921.

Additions and Corrections to my List of the Birds of Australia, 1913, and Check-List Part I, 1920. By G. M. Mathews.—Contains several new names.

Notes of Interest. By G. M. Mathews and Tom Iredale.—Discusses numerous neglected works and suggests a number of apparently necessary changes in nomenclature. Some North American birds are affected as, *Larus leucopterus* which becomes *L. glaucoides* Mayer, and *L. franklini* which becomes *L. pipizcan* Wagler.

Revue Francaise d'Ornithologie. Vol. 13, No. 146. June 7, 1921.

Contribution to a Study of the Mediterranean Forms of the Peregrine Falcon. By L. Lowanden. [In French.]

Dr. Millet Horsan's guide to the commoner birds of Africa is continued.

Revue Francaise d'Ornithologie. Vol. 13, No. 147. July 7, 1921.

The Ornithological Society of France. By A. Menegaux.—Founded May 29, 1921, with 120 members, Dr. Menegaux being the president and J. Rapine the secretary.

Birds of the Gulf of Mamara and the environs of Rabat. By F. R. C. Jourdain.

L'Oiseau. II, No. 6. June, 1921. [In French.]

Apoplexy and Diarrhoea in Birds. By A. Decoux.

L'Oiseau. II, No. 8. Aug., 1921.

Breeding in Captivity of the Hemipode *Turnix tanki*. By D. Seth Smith.

A Small Collection of Birds of Chile. By A. Fellay.

NOTES AND NEWS

THE admirable work being done by the National Association of Audubon Societies is familiar, in a general way, to most of the members of the A. O. U., but the work is today so varied and far reaching that much of it is not fully appreciated. One of the most important features of the Association's activity is the educational work accomplished through the Junior Audubon Classes.

Eleven years ago Mr. T. Gilbert Pearson, now president of the Association, conceived the idea of organizing children into "Audubon" Classes on a large scale, and supplying them material, double the value of what their fees would amount to. He induced Mrs. Russel Sage to give \$5,000 a year for three years in order that the plan might be tried out. Later others were interested, especially one anonymous contributor who for many years past has provided \$20,000 annually for carrying on the work. The Clubs or classes are organized chiefly in the schools and each teacher who succeeds in forming a club of twenty-five or more receives a free subscription to 'Bird-Lore' for one year.

In exchange for a ten cent fee each child receives a series of Educational Leaflets with colored pictures of birds, and an Audubon button. The children are taught that all useful wild birds and their nests and eggs should be protected. They are taught also to make bird-boxes in the schools and erect them for the use of hole-nesting birds. In this way there have been built and erected, as many as 175,000 bird boxes in one year. Entertainments, consisting of songs, plays, and recitations about birds, are given by hundreds of Junior Audubon Classes throughout the country. In the winter the children are taught to feed the birds by tying suet to the limbs of trees and scattering crumbs, seeds and broken grain where the birds can get them. The extent of the children's activities depends only upon the interest and resourcefulness of the teachers heading the clubs.

Since the work began eleven years ago 66,709 Junior Clubs have been formed, with a total membership of 1,676,743, while during the year which closed June 1, 1921, 5,851 clubs were enrolled with 229,787 children as members. These Clubs were organized in every State in the Union and many of the Provinces of Canada. Unfortunately the funds at the disposal of the Association were not sufficient to furnish material for all applicants and during the past two years the fees of many thousands of disappointed children have had to be returned. Within the past few weeks matters have taken a turn which will make it possible during the coming year to have material sufficient to supply at least 300,000 children. This is due to an increased number of subscribers to the undertaking and to a decrease in the cost of paper.

Many of the State Audubon Societies and local Bird Clubs give this work their hearty support. Some have contributed financially and some send representatives into the schools to assist in carrying on the work of instruction, which is also done by the regular agents of the Association. During the past year Mrs. Mary S. Sage, field agent for Long Island, worked in more than 100 communities, giving in all, 206 lectures to audiences aggregating more than 20,000, while Messrs. Forbush and Packard and Dr. Eugene Swope rendered similar service.

The public press during the past year has contained hundreds of notices of the organization and activities of these Junior Clubs. This elementary instruction in bird-study besides educating the coming generation in the principles of conservation, constitutes probably the most extensive scheme for developing an interest in natural history among the children, that has ever been attempted in any country.

Another important result of the work is the development of ornithologists. It is hardly conceivable that among the thousands of children who are made acquainted with wild bird life there will not be many who will continue the study of birds throughout their life, becoming competent observers of bird migration, intelligent bird banders and members of the American Ornithologists' Union.

WILLIAM JAMES BENNETTS, an Associate of the Union since 1901, died at the Washington Sanitarium, Takoma Park, Md., Sept. 13, 1920. He was born at Cornwall, England, May 20, 1865, and when four years of age came to America with his parents who took up their residence at Port Perry, Ontario. His early education was received in the public schools of Ontario and later he attended the University of Toronto. In 1890 he settled in Milwaukee, Wis., and while there became Secretary of the Natural History Society of that city. In 1902 he moved to Washington, D. C., where he was employed in the Navy Department, in charge of the mechanical section in the Bureau of Construction and Repair. Mr. Bennetts was much interested in birds, had a library of ornithological works, and in addition to his membership in the Union he was a member of the Biological Society of Washington. He is survived by his widow, a son and a daughter.—T. S. P.

OWING to conditions beyond the control of the editor and publisher, 'The Auk' is again delayed. We deeply regret this fact but hope to bring the publication up to date early in the ensuing year.

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ERRATA

Page 157, line 7, for 1879 read 1878.

- " 157, " 8, insert after Curator of, crustacea and mollusca in.
- " 323, " 29, for they would read would they.
- " " 31, for it would read would it.
- " " 34, after log insert a ?
- " 434, " 23, for *trunneus*, read *brunneus*.
- " 465, " 15, for Greatcatcher, read Gnatcatcher.
- " 475, " 46, for V read IV.
- " 479, " 9, for White read Mute.
- " 493, " 42, for 1900 read 1890.
- " 579, " 3, for *stejenegeri* read *stejnegeri*.

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CORRESPONDING FELLOWS.

- ABBOTT, DR. WILLIAM L., 400 S. 15th St., Philadelphia, Pa.....1916
- ALFARO, DON ANASTASIO, San José, Costa Rica.....1888
- ALPHÉRAKY, SERGIUS N., Imperial Acad. Sci., Petrograd, Russia.... 1913
- ARRIBALZAGA, ENRIQUE LYNCH, Resistencia, Chaco, Argentina..... 1918
- ARRIGONI DEGLI ODDI, COUNT ETTORE, Univ. of Padua, Padua, Italy1900
- ASHBY, EDWIN, Blackwood, Adelaide, South Australia.... 1918
- BANNERMAN, DAVID ARMITAGE, 6 Palace Gardens Terrace, Kensing-
ton, London, W. 8, England.....1916

BATE, Miss DOROTHEA M. A., Bassenden House, Gordon, Berwickshire, Scotland	1920
BATES, GEO. LATIMER, Bitye, via Yaunde, Cameroon, W. Africa.....	1919
BAXTER, Miss EVELYN VIDA, The Grove, Kirkton of Largo, Fifeshire, Scotland.....	1919
BEDDARD, FRANK EVERS, Zoöl. Society of London, London, England.....	1917
BERTONI, Dr. ARNOLDO de WINKELREID, Puerto Bertoni, Paraguay..	1919
BIANCHI, Dr. VALENTINE, Imperial Zoöl. Museum, Petrograd, Russia.....	1916
BLAAUW, FRANS ERNST, Goorlust 'sGraveland, Helversum, Holland.....	1920
BONHOTE, JOHN LEWIS, Park Hill House, Charleston, England.....	1911
BUREAU, Dr. LOUIS, École de Médecine, Nantes, France.....	1884
BÜTTIKOFER, Dr. JOHANNES, Zoölogical Garden, Rotterdam, Holland.....	1886
CAMPBELL, ARCHIBALD James, "Bulgaroo," Broughton, R'd, Surrey Hills, Victoria, Austrailia.....	1902
CARRIKER, M. A., Jr., Apartado 51, Santa Marta, Colombia... (1907)	1912
CHAMBERLAIN, MONTAGUE, Cambridge, Mass..... (Founder)	1901
CHUBB, CHARLES, British Museum (Nat. Hist.) Cromwell Road, London, S. W., 7, England.....	1911
CLARKE, WILLIAM EAGLE, Royal Scottish Museum, Edinburgh.....	1889
COLLINGE, Dr. WALTER E., The Museum, York, England.....	1918
DALGLEISH, JOHN J., Brankston Grange, Bogside Station, Alloa, Scotland.....	1883
DELACOUR, JEAN, Chateau de Cleres, Seine Inférieure, France.....	1920
DOLE, SANFORD B., Honolulu, Hawaii.....	1883
ECHT, ADOLPH BACHOFEN VON, Nussdorf, near Vienna, Austria.....	1883
FEILDEN, Col. HENRY WEMYSS, Burwash, Sussex, England.....	1884
FERRARI-PEREZ, Prof. FERNANDO, Tacubaya, D. F., Mexico.....	1885
FREKE, PERCY EVANS, South Point, Limes Road, Folkstone, England.....	1883
GEE, NATHANIEL GIST, Summerton, S. C.....	1919
GODWIN-AUSTEN, Lieut.-Col. HENRY HAVERSHAM, Nore, Hascombe, Godalming, Surrey, England.....	1884
GRANDIDIER, ALFRED, 6 Rond-Point des Champs Elysées, Paris.....	1883
GRANT, Major CLAUDE HENRY BAXTER, 2 Lebanon Gardens, West Hill, Wandsworth, London, S. W. 18, England.....	1920
GURNEY, JOHN HENRY, Keswick Hall, Norwich, England.....	1883
GYLDENSTOLPE, Count NILS, Naturhistoriska Riksmuseum, Vetenskapsakademien, Stockholm, Sweden.....	1918
HALL, ROBERT, Tasmanian Museum, Hobart, Tasmania.....	1916
HARTING, JAMES EDMUND, Portmore Lodge, Weybridge, Surrey, England.....	1883
HAVILAND, Miss MAUD D., Old Hall, Newnham College, Cambridge, England.....	1920
HELMS, Dr. O., Sanatoriet ved Nakkebøllefjord pr Pejruk, Denmark.....	1920
HENNICKE, Dr. CARL R., Gera, Reuss, Germany.....	1907

HENSON, HARRY V., Yokohama, Japan.....	1888
HUDSON, WILLIAM HENRY, Tower House, St. Luke's Road, West- bourne Park, London, W. England.....	1895
HULL, ARTHUR FRANCIS BASSETT, Box 704, Sydney, N. S. W.....	1919
INGRAM, Capt. COLLINGWOOD, Forest House, Westgate-on-Sea, Kent, England.....	1920
IREDALE, TOM, 39 Northcote Ave., Ealing, London, W. 5, England...	1918
JACKSON, Miss ANNIE C., Swordale, Evanton, Ross-shire, Scotland....	1919
JOURDAIN, Rev. FRANCIS C. R., Appleton Rectory, Abingdon, Berks, England.....	1918
KLOSS, CECIL BODEN, Kuala Lumpur, Federated Malay States.....	1918
KRÜPER, Dr. THEOBALD J., University Museum, Athens, Greece.....	1884
KURODA, NAGAMICHI, Fukuyoshi Cho, Akasaka, Tokyo, Japan.....	1918
LEACH, Dr. JOHN ALBERT, Eyrecourt, Canterbury, Victoria, Australia	1919
LE SOUÉF, DUDLEY, Zoological Gardens, Melbourne, Australia.....	1911
MADÁRASZ, Dr. JULIUS VON, Matyas Sir 14, Budapest, Hungary.....	1884
MATHEWS, GREGORY M., Foulis Court, Fair Oak, Hants, England...	1911
MENZBIER, Prof. Dr. MICHAEL, University for Women, Devitchje, Pola, Moscow, Russia.....	1884
MILLAIS, JOHN GUILLE, Compton's Brow, Horsham, Sussex, England	1911
MITCHELL, Dr. P. CHALMERS, Zoological Society, Regents Park, Lon- don, N. W. 8, England.....	1919
MOFFETT, LACY I., 5 Quinsan Gardens, Shanghai, China.....	1919
NICHOLSON, FRANCIS, Ravenscroft, Windermere, Westmoreland, Eng- land.....	1884
NICOLL, MICHAEL JOHN, Valhalla House, Zoöl. Gardens, Giza, Egypt	1919
Ogilvie-Grant, WILLIAM ROBERT, British Museum (Nat. Hist.), Cromwell Road, London, S. W. 7, England.....	1899
PHILLIPS, MONTAGU AUSTIN, Devonshire House, Reigate, Surrey, England.....	1919
RAMSDEN, Dr. CHARLES T., Box 146, Guantanamo, Cuba..... (1912)	1918
RINGER, FREDERIC, Nagasaki, Japan.....	1888
RINTOUL, Miss LEONORE JEFFREY, Lahill Largo, Fifeshire, Scotland..	1919
ROBERTS, AUSTEN, Pretoria, South Africa.....	1920
ROBINSON, HERBERT C., Selangor State Museum, Kuala Lumpur, Federated Malay States.....	1918
SHÖLER, Dr. E. LEHN, Uraniavej 14-16, Copenhagen, Denmark.....	1920
SETH-SMITH, DAVID, 34 Elsworthy Road, South Hampstead, London, N. W. 3, England.....	1920
SNOUKAERT VON SCHAUBURG, Baron RENÉ C. E. G. J. van, Doorn, Holland.....	1920
SNETHLAGE, Dr. EMILIA, Museu Goeldi, Pará, Brazil.....	1915
SWANN, H. KIRKE, 38 Great Queen St., Kingsway, London, W. C. 2, England.....	1919

SWYNNERTON, C. F. M., Poste Restante, Dar-es-Salaam, German East Africa.....	1918
THEEL, Dr. JOHAN HJALMAR, University of Upsala, Upsala, Sweden..	1884
TICEHURST, N. F., 24 Pevensey Road, St. Leonards-on-Sea, England..	1918
TSCHUSI ZU SCHMIDHOFFEN, VICTOR, RITTER VON, Villa Tannen- hof, bei Hallein, Salzburg, Austria.....	1884
TURNER, Miss EMMA L., Langton Close, Girton, Cambridge, England	1920
UCHIDA, SEINOSUKE, No. 1, 1-chome Kitamachi, Aoyama, Tokyo, Japan.....	1919
WATERHOUSE, F. H., Zoöl. Soc. of London, Regents' Park, London, N. W. 8, England.....	1889
WHITE, HENRY LUKE, Belltrees, Scone, New South Wales.....	1920
WHITE, Capt. SAMUEL ALBERT, Wetunga, Fulham, South Australia...	1919
WINGE, Dr. HERLUF, Univ. Zoöl. Museum, Copenhagen, Denmark...	1903
WITHERBY, HARRY FORBES, 12 Chesterfield Gardens, Hampstead, London, N. W. 3, England.....	1916
WORCESTER, Prof. DEAN C., Manila, P. I.....	1903
ZELEDON, Don JOSÉ C., San José, Costa Rica.....	1884

MEMBERS.

*Life Members

ALLEN, ARTHUR A., McGraw Hall, Cornell Univ., Ithaca, N. Y.. (1909)	1914
ALLEN, FRANCIS H., 4 Park St., Boston, Mass.....	(1888)1901
ALLEN, Dr. GLOVER M., 234 Berkeley St., Boston, Mass.....	(1896)1904
ANDERSON, Dr. R. M., Mus. Geol. Survey, Ottawa, Canada...	(1907)1914
ATTWATER, H. P., 2120 Genesee St., Houston, Texas.....	(1891)1901
BAILEY, VERNON, 1834 Kalorama Ave., Washington, D. C....	(1887)1901
BAILEY, Mrs. VERNON, 1834 Kalorama Ave., Washington, D. C.	(1885)1901
BAILY, WILLIAM L., 220 E. Lancaster Ave., Ardmore, Pa.....	(1886)1901
BARBOUR, Dr. THOMAS, Mus. Comp. Zoölogy, Cambridge, Mass. (1903)	1914
BARTSCH, Prof. PAUL, U. S. Nat. Museum, Washington, D. C.	(1896)1902
BECK, ROLLO HOWARD, R. D. 288, San José, Calif.....	(1894)1917
BERGTOLD, Dr. W. H., 1159 Race St., Denver, Colo.....	(1889)1914
BOND, FRANK, 3127 Newark St., N. W., Washington, D. C....	(1887)1901
BOWLES, JOHN HOOPER, The Woodstock, Tacoma, Wash.....	(1891)1910
BRAISLIN, Dr. WILLIAM C., 425 Clinton Ave., Brooklyn, N. Y.	(1894)1902
BROOKS, ALLAN, Okanagan Landing, B. C.....	(1902)1909
BROOKS, Wm. SPRAGUE, 234 Berkeley St., Boston, Mass.....	(1907)1917
BRYAN, Wm. ALANSON, Museum Exposition Park, Los Angeles, Calif. (1898)	1901
BRYANT, Dr. HAROLD CHILD, Mus. Vert. Zoöl., Berkeley, Calif.	(1913)1918
BURNS, FRANK L., Berwyn, Pa.....	(1891)1901
BUTLER, AMOS W., 52 Downey Ave., Irvington, Indianapolis, Ind. (1885)	1901

- CHAMBERS, W. LEE, Box 4, Eagle Rock, Calif. (1907)1913
 CHAPIN, JAMES P., Amer. Mus. Nat. Hist., New York, N. Y. ... (1906)1917
 CHERRIE, GEORGE K., Newfane, Vt. (1891-1912) (1917)1918
 CLARK, Dr. HUBERT L., Mus. Comp. Zool. Cambridge, Mass. ... (1886)1902
 DAWSON, WM. L., R. D. 3, Box 110, Santa Barbara, Calif. (1895)1905
 DEANE, WALTER, 29 Brewster St., Cambridge, Mass. (1897)1901
 EATON, Prof. ELON HOWARD, 678 Main St., Geneva, N. Y. (1895)1907
 EVERMANN, Prof. B. W., Calif. Acad. Sci., San Francisco, Calif. (1883)1901
 FARLEY, JOHN A., 52 Cedar St., Malden, Mass. (1904)1919
 FINLEY, WILLIAM L., 651 East Madison St., Portland, Ore. (1904)1907
 GABRIELSON, IRA N., 220 P. O. Bldg., Portland, Ore. (1912)1920
 GAULT, BENJAMIN TRUE, 2313 Washington Blv'd., Chicago, Ill. (1885)1903
 GOLDMAN, EDWARD A., Biological Survey, Washington, D. C. (1897)1902
 GRISCOM, LUDLOW, 37 5th Ave., New York, N. Y. (1908)1918
 HARPER, FRANCIS, 3101 24th St., N. E., Washington, D. C. (1907)1917
 *HARRIS, HARRY, 18 West 52nd St., Kansas City, Mo. (1911)1919
 HERRICK, Prof. FRANCIS H., Adelbert College, Cleveland, O. ... (1913)1919
 HERSEY, F. SEYMOUR, 6 Maple Ave., Taunton, Mass. (1911)1916
 HOFFMAN, RALPH, Santa Barbara School, Carpenteria, Calif. ... (1893)1901
 HOLLISTER, NED, Nat. Zoological Park, Washington, D. C. (1894)1910
 HOWELL, A. B., 268 S. Orange Grove Ave., Pasadena, Calif. ... (1909)1916
 HOWELL, ARTHUR H., 2919 S. Dakota Ave., Washington, D. C. (1889)1902
 JACOBS, J. WARREN, 404 S. Washington St., Waynesburg, Pa. ... (1889)1904
 JEFFRIES, WILLIAM A., 11 Pemberton Square, Boston, Mass. ... (1883)1901
 JOB, HERBERT K., 291 Main St., West Haven, Conn. (1896)1901
 KALMBACH, EDWIN R., Biological Survey, Washington, D. C. ... (1910)1915
 *KENNARD, F. H., Dudley Road, Newton Centre, Mass. (1892)1912
 KNOWLTON, F. H., U. S. Nat. Mus., Washinton, D. C. (1883)1902
 *LAW, J. EUGENE, Mus. Vert. Zool., Berkeley, Calif. (1907)1916
 MACKAY, GEORGE H., 304 Bay State Road, Boston, Mass. (1890)1901
 MAILLIARD, JOHN W., 230 California St., San Francisco, Calif. (1895)1901
 MILLER, Dr. LOYE HOLMES, Southern Branch Univ. Calif., Los Angeles, Calif. (1918)1920
 MOORE, ROBERT THOMAS, Onawa, Me. (1898)1914
 MORRIS, GEORGE SPENCER, Olney, Philadelphia, Pa. (1887)1903
 MORRIS, ROBERT O., 82 Temple St., Springfield, Mass. (1888)1904
 MURDOCH, JOHN, 16 High Rock Way, Allston, Mass. (1883)1901
 NICHOLS, JOHN T., Am. Mus. Nat. Hist., New York, N. Y. (1901)1914
 NORTON, ARTHUR H., Mus. Nat. Hist., 22 Elm St., Portland, Me. (1890)1902
 PEARSON, T. GILBERT, 1974 Broadway, New York, N. Y. (1891)1902
 PENARD, THOMAS E., 12 Norfolk R'd, Arlington, Mass. (1912)1919
 PENNOCK, CHAS. J., Kennett Square, Pa. (1888)1901
 PETERS, JAMES LEE, Harvard, Mass. (1904)1918
 PHILLIPS, Dr. JOHN C., WENHAM, Mass. (1904)1912
 PREBLE, EDWARD A., Biological Survey, Washington, D. C. (1892)1901

- RATHBURN, SAMUEL F., 304 Marion Bldg., Seattle, Wash..... (1893)1902
 RHODES, SAMUEL N., 81 Haddon Ave., Haddonfield, N. J..... (1885)1901
 RIVES, Dr. WM. C., 1702 Rhode Island Ave., Washington, D. C. (1885)1901
 ROBINSON, Col. WIRT, U. S. A., West Point, N. Y..... (1897)1901
 SAUNDERS, ARETAS A., 48 Longview Ave., Fairfield, Conn..... (1907)1920
 SETON, ERNEST THOMPSON, Greenwich, Conn..... (1883)1901
 *SHERMAN, Miss ALTHEA R., National via McGregor, Iowa..... (1907)1912
 *SHIRAS, Hon. GEORGE, 3d, Stoneleigh Court, Washington, D. C.
 (1907)1915
 STEPHENS, FRANK, Nat. Hist. Museum, Dan Diego, Calif..... (1883)1901
 STEPHENS, Prof. T. C., Morningside College, Sioux City, Iowa. (1909)1920
 STRONG, Dr. REUBEN M., 706 S. Lincoln St., Chicago, Ill..... (1889)1903
 *SWALES, BRADSHAW HALL, U. S. Nat. Mus., Washington, D. C. (1902)1909
 SWENK, MYRON W., 1410 N. 37th St., Lincoln, Neb..... (1904)1929
 THAYER, JOHN ELIOT, Lancaster, Mass..... (1898)1905
 TOWNSEND, Dr. CHARLES H., Aquarium, Battery Park, New York,
 N. Y..... (1883)1901
 TOWNSEND, Dr. C. W., 98 Pinckney St., Boston, Mass..... (1901)1905
 TROTTER, Dr. SPENCER. Swarthmore College, Swarthmore, Pa. (1888)1901
 TYLER, Dr. WINSOR M., 522 Mass. Ave., Lexington, Mass.... (1912)1917
 WARREN, E. R., 1511 Wood Ave., Colorado Springs, Colo.... (1902)1910
 WAYNE, ARTHUR T., Mt. Pleasant, S. C..... (1905)1906
 WILLETT, GEORGE, 2123 Court St., Los Angeles, Calif..... (1912)1913
 *WILLIAMS, ROBERT WHITE, Dept. Agric., Washington, D. C.. (1900)1918
 *WOLCOTT, Dr. ROBERT H., State University, Lincoln, Neb.... (1901)1903
 WOOD, NORMAN A., Museum Univ. of Mich. Ann Arbor, Mich. (1904)1912
 WRIGHT, Dr. ALBERT H., Upland Road, Ithaca, N. Y..... (1906)1919
 WRIGHT, Mrs. MABEL OSGOOD, Fairfield, Conn..... (1895)1901

ASSOCIATES.

*Life Associate

- ABBOTT, CLINTON GILBERT, Orchard Hill, Rhinebeck, N. Y..... 1898
 ABBOTT, Miss HARRIET, Fryeburg, Me..... 1918
 ADAMS, BENJAMIN, Wethersfield, Conn..... 1911
 ADAMS, Rev. CHARLES L., New Canaan, Conn..... 1920
 ADAMS, WILLIAM C., 43 Clyde St., Newtonville, Mass..... 1920
 ADAMS, Dr. Z. B., 43 Cottage Farm Road., Longwood, Mass..... 1908
 ADELMANN, HOWARD BERNHARDT, Stimson Hall, Cornell Univ., Ithaca
 N. Y..... 1919
 AHRENS, Dr. T. G., Landanerstrasse 4, Berlin-Wilmersdorf, Germany. 1920
 AIKEN, Hon. JOHN, Superior Court, Court House, Boston, Mass..... 1905
 AIMAR, Dr. CHARLES PONS, 4 Vanderhorst St., Charleston, S. C. . . 1916

ALBRIGHT, HORACE MARDEN, Yellowstone Park, Wyo.....	1919
*ALEXANDER, Miss ANNIE M., Suisun City, Calif.....	1911
ALEXANDER, EDWARD GORDON, 1603 South St., Lexington, Mo.....	1919
ALLEN, Mrs. AMELIA SANBORN, 37 Mosswood R'd, Berkeley, Calif.....	1919
ALLEN, ARTHUR F., Sioux City, Iowa.....	1919
ALLEN, MARY P., 206 Moore St., Hackettstown, N. J.....	1913
ALMY, Mrs. CHARLES, 147 Brattle St., Cambridge, Mass.....	1919
ANDERSON, EDWIN C., Dell Rapids, S. D.....	1919
ANDERSON, Mrs. J. C., Great Barrington, Mass.....	1903
ANDREWS, WILLIAM, Courtney, Jackson Co., Mo.....	1919
ANGELL, WALTER A., 135 Mathewson St., Providence, R. I.....	1901
ANKENEY, Miss HELEN, Rt. 10, Xenia, Ohio.....	1920
ANTHONY, H. E., Amer. Mus. Nat. Hist., New York, N. Y.....	1911
ARMITAGE, LUCIUS, 282 E. 162nd St., New York, N. Y.....	1918
ARMOUR, Mrs. GEORGE, Allison House, Princeton, N. J.....	1920
ARMSTRONG, EDWARD E., 2249 Calumet Ave., Chicago, Ill.....	1904
ARNOLD, EDWARD, Grand Trunk R'y., Montreal, Quebec.....	1894
ARNOLD, Dr. W. W., 504 N. Nevada Ave., Colorado Springs, Colo.....	1910
ARTHUR, EDMUND WAITE, 7438 Perryville Ave., Ben Avon, Pitts- burgh, Pa.....	1919
ARTHUR, STANLEY CLISBY, 6043 Perrier St., New Orleans, La.....	1916
ASPINWALL, Mrs. CLARENCE A., 1839 Wyoming Ave., Washington, D. C.....	1916
ATHERTON, EDWARD H., 82 Ruthven St., Boston, 21, Mass.....	1917
ATWELL, GEORGE C., Strafford, N. H.....	1920
AVERILL, CHARLES KETCHUM, 406 Stratford Ave., Bridgeport, Conn.....	1919
AYRES, Miss MARY ADELINE, 119 High St., Medford Mass.....	1915
BABCOCK CLYDE H. 3426 W. Kiowa St., Colo. Springs, Colo.....	1920
BABCOCK, DEAN, Long's Peak, Colo.....	1911
BABCOCK, DR. HAROLD LESTER, Woodleigh Road, Dedham, Mass....	1916
BACON, FRANCIS L., 236 Winona Ave., Germantown, Pa.....	1917
BADÉ, Dr. WM. FREDERIC, 2616 College Ave., Berkeley, Calif.....	1916
BADGER, ARTHUR C., 167 Dudley Road, Newton Centre, Mass.....	1917
BADGER, LESTER R., 2401 Lake Place, Minneapolis, Minn.....	1920
BAER, JOHN LEONARD, Apt. 1, The Maury, 19th & G Sts., N. W., Washington, D. C.....	1920
BAGG, AARON C., 70 Fairfield Ave., Holyoke, Mass.....	1916
BAGG, EGBERT, 27 Sunset Place, Utica, N. Y.....	1916
BAGG, JOHN LEONARD, 89 Lexington Ave., Holyoke, Mass.....	1918
BAILEY, ALFRED M., Colorado Mus. Nat. Hist., Denver, Colo.....	1918
BAILEY, Prof. GUY A., Geneseo, N. Y.....	1910
BAILEY, SAMUEL WALDO, 64 S. Mountain R'd., Pittsfield, Mass.....	1909
BAIRD, Miss KATHERINE B., 815 Webster St., N. W., Washington, D. C.....	1918
BAKER, JACK D., Willets, Mendocino Co., Calif.....	1920

*BALDWIN S. PRENTISS, Williamson Bldg., Cleveland, Ohio.....	1917
BALES, Dr. BLENN R., 149 W. Main St., Circleville, Ohio.....	1907
BALL, Mrs. BENNET F., Oakville, Conn.....	1905
BALL, EDWARD M., East Falls Church, Va.....	1918
BALL, Dr. JAS. P., 5001 Frankford Ave., Philadelphia, Pa.....	1911
BARBER, Prof. BERTRAM A., Hillsdale College, Hillsdale, Mich.....	1920
BARBER, FURNALD K., La Fox, Ill.....	1920
BARBOUR, Rev. ROBERT, Y. M. C. A., Montclair, N. J.....	1902
BARKER, Miss HELEN, 421 E. Adams St., Sandusky, O.....	1918
BARNARD, Judge JOB, 1401 Fairmont St., Washington, D. C.....	1886
BARNES, CHARLES SYDNEY, 19 W. 31st St., Bayonne, N. J.....	1920
BARNES, CLAUDE T., 359 Tenth Ave., Salt Lake City, Utah.....	1908
BARNES, Hon. R. MAGOON, Lacon, Ill.....	1880
BARRETT, CHAS. H. M., 1339 Valley Place S. E., Washington, D. C.....	1912
BARRETT, HAROLD LAWRENCE, 172 Huntington Ave., Boston, Mass.....	1909
BARROWS, IRA, 15 Maiden Lane, New York, N. Y.....	1920
BARROWS, Mrs. W. H., 113 Appleton Ave., Pittsfield, Mass.....	1920
BARRY, Miss ANNA K., 5 Bowdoin Ave., Dorchester, Mass.....	1907
BARTLETT, Miss MARY F., 227 Commonwealth Ave., Boston, Mass.....	1912
BARTRAM, EDWIN B., Bushkill, Pike Co., Pa.....	1913
BASSETT, FRANK NEWTON, 1338 8th St., Alameda, Calif.....	1919
BATCHELOR, MARION W., 27 Janssen Place, Kansas City, Mo.....	1916
BATES, Miss EMELINE CLARK, 59-69 Scott St., Chicago, Ill.....	1920
BATES, Rev. J. M., Red Cloud, Neb.....	1918
BATTEN, GEORGE, 46 Lloyd Road, Montclair, N. J.....	1914
BAYNES, ERNEST HAROLD, Meriden, N. H.....	1918
BEARD, THEODORE R., 970 Lincoln Place, Boulder, Colo.....	1920
BECKFORD, ARTHUR W., 10 Park St., Danvers, Mass.....	1919
BELL, Dr. W. B., Biological Survey, Washington, D. C.....	1912
BENJAMIN, Mrs. ALFRED, 350 Summer Ave., Newark, N. J.....	1920
BENJAMIN, C. H., 607 University St., W. Lafayette, Ind.....	1920
BENNETT, Rev. GEORGE, Iowa City, Iowa.....	1913
BENSON, FRANK W., 46 Washington Sq., Salem, Mass.....	1920
BERLIN, Mrs. CORA D., 813 Second St., Marietta, Ohio.....	1920
BERMAN, DANIEL, 70 Morningside Drive, New York, N. Y.....	1919
BICKNELL, Mrs. F. T., 319 S. Normandie Ave., Los Angeles, Calif.....	1913
BIDDLE, Miss EMILY WILLIAMS, 2201 Sansom St., Philadelphia, Pa.....	1898
BIGELOW, Mrs. A. P., Ogden, Utah.....	1919
BIGELOW, Dr. LYMAN F., 80 Winter St., Norwood, Mass.....	1914
BIGELOW, DR. WILLIAM STURGIS, 56 Beacon St., Boston, Mass.....	1920
BISHOP, SHERMAN C., N. Y. State Museum, Albany, N. Y.....	1919
BLACK, ANDREW A., Margaret, Man., Canada.....	1919
BLACKWELDER, ELIOT, 317 Railway Exch. Bldg., Denver, Colo.....	1895
BLAISDELL, Miss RUTH, 126 Grand View Ave., Wollaston 10, Mass.....	1920
BLAKE, BENJAMIN S., Auburndale 66, Mass.....	1920

BLOOMFIELD, Mrs. C. C., 723 Main St., W. Jackson, Mich.....	1901
BLOWERS, Miss AGNES, Rt. 2, Morrisville, N. Y.....	1920
BOARDMAN, Miss E. D., 416 Marlborough St., Boston, Mass.....	1906
BODINE, Mrs. DONALDSON, 4 Mills Place, Crawfordsville, Ind.....	1916
BOEHNER, REGINALD STEPHEN, Syracuse Univ., Syracuse, N. Y.....	1919
BOGARDUS, Miss CHARLOTTE, Elm St., Coxsackie, N. Y.....	1909
BOLT, BENJAMIN FRANKLIN, 1421 Prospect Ave., Kansas City, Mo....	1909
BOND, HARRY L., Lakefield, Minn.....	1908
BONFELS, FREDERICK G., The Denver Post, Denver, Colo.....	1918
BONNETT, D. B., Bay Head, N. J.....	1920
BORLAND, Wm. G., 7 Wall St., New York, N. Y.....	1911
BOSSON, CAMPBELL, 30 State St., Boston, Mass.....	1906
*BOULTON, Wm. B., Morristown Trust Co., Morristown, N. J.....	1919
BOURNE, THOMAS L., Hamburg, N. Y.....	1913
BOWDISH, B. S., Demarest, N. J.....	1891
BOWDISH, Mrs. B. S., Demarest, N. J.....	1902
BOWDITCH, Dr. HAROLD, 44 Harvard Ave., Brookline, Mass.....	1900
BOWDITCH, JAMES H., 903 Tremont Bldg., Boston, Mass.....	1913
BOYD, DONALD H., Box 466, Hobart, Ind.....	1920
BOYD, Mrs. HARRIET T., 17 Marsh St., Dedham, Mass.....	1917
BRACKEN, Mrs. HENRY M., 1010 Fourth St., S. E., Minneapolis, Minn.	1897
BRADBURY, W. C., 1440 Race St., Denver, Colo.....	1915
BRADLEE, THOMAS STEVENSON, South Sudbury, Mass.....	1902
*BRANDRETH, COURTNEY, Ossining, N. Y.....	1905
*BRANDRETH, FRANKLIN, Ossining, N. Y.....	1889
ERANDT, HERBERT W., 2025 East 88th St., Cleveland, Ohio.....	1915
BRANNON, PETER A., Box 358, Montgomery, Ala.....	1919
BREDER, CHAS. M. JR., Bureau Fisheries, Washington, D. C.....	1919
BREWSTER, Mrs. WILLIAM, The Charlesgate, 535 Beacon St., Boston, Mass.....	1912
BRICKENSTEIN, Miss MARY R., 1603 19th St., Washington, D. C....	1920
BRIDGE, EDMUND, 52 Wyman St., West Medford, Mass.....	1910
*BRIDGE, Mrs. EDMUND, 52 Wyman St., West Medford, Mass.....	1902
BRIMLEY, H. H., State Museum, Raleigh, N. C.....	1904
BRITTEN, Capt. G. S., 807 Walnut Ave., Syracuse, N. Y.....	1913
BROCKWAY, ARTHUR W., Hadlyme, Conn.....	1912
BRONSON, BARNARD S., 175 Jay St., Albany, N. Y.....	1920
BROOKING, A. M. Inland, Neb.....	1920
BROOKS, Rev. EARLE AMOS, 10 Beacon St., Everett, Mass.....	1892
BROOKS, GORHAM, 60 State St., Boston, Mass.....	1919
BROWN, Miss ANNIE H., 31 Maple St., Stoneham, Mass.....	1909
BROWN, Miss BERTHA L., 53 Court St., Bangor, Me.....	1918
BROWN, EDMUND P., 48 Union St., Belfast, Me.....	1920
BROWN, EDWARD J., 1609 S. Van Ness Ave., Los Angeles, Calif.....	1891
BROWN, G. FRANKLIN, "Stonebridge," Needham, Mass.....	1917
BROWN, HARRY A., 40 Talbot St., Lowell, Mass.....	1912

BROWN, MRS. HENRY TEMPLE, Lancaster, Mass.....	1912
BROWN, PLUMB, M. D., 175 State St., Springfield, Mass.....	1920
BROWN, ROY M., Boone, N. C.....	1919
BROWN, SAMUEL E., 10 Oakland St., Lexington, Me.....	1920
BROWN, WM. JAMES, 250 Oliver Ave., Westmount, Quebec.....	1908
BROWNING, WM. HALL, 16 Cooper Square, New York, N. Y.....	1911
BRUEN, FRANK, 69 Prospect St., Bristol, Conn.....	1908
BRUMBAUGH, CHALMERS S., 1020 Cathedral St., Baltimore, Md.....	1916
*BRUUN, CHAS A., 314 Reliance Bldg., Kansas City, Mo.....	1919
BUCHANAN, ROLLIN E., Excelsior, Minn.....	1918
BULL, CHARLES L., Oradell, N. J.....	1920
BULLOCK, D. S., c/o Amer. Embassy, Buenos Aires, Argentina....	1920
BUNKER, CHARLES D., Kansas University Museum, Lawrence, Kan.....	1916
BURBANK, MRS. DELANCEY G., 17 Cherry St., N. Adams, Mass.....	1920
BURGESS, HENRY C., M. D., 156 N. Main St., Canandaigua, N. Y....	1920
BURGESS, JOHN KINGSBURY, "Broad Oak," Dedham, Mass.....	1898
BURGESS, THORNTON WALDO, 61 Washington R'd., Springfield, Mass.....	1919
BURLEIGH, THOS. D., State College Agric., Athens, Ga.....	1913
BURNETT, WILLIAM L., State Agric. College, Fort Collins, Colo.....	1895
BURNHAM, JOHN, 218 Timken Bldg., San Diego, Calif.....	1920
BURNHAM, STEWART HENRY, c/o A. G. Lamoreux, Forest Home, R. 2, Ithaca, N. Y.....	1919
BURTCH, VERDI, Branchport, N. Y.....	1903
BUSHINGER, Miss MARY G., Monte Vista, Colo.....	1919
BUTLER, EDWARD, Baines, La.....	1920
BUTLER, Miss VIRGINIA, Stockbridge, Mass.....	1919
BUTTERWORTH, FRANK SEILER, Choate School, Wallingford, Conn.....	1918
BUTTS, HARRY W., Gambrills, Anne Arundel Co., Md.....	1920
BUZZELL, Mrs. JAS. C., 11 Hudson St., Bangor, Me.....	1918
BYRD, Mrs. HIRAM, University, Ala.....	1918
CADUC, EUGENE E., 531 Massachusetts Ave., Boston, Mass.....	1910
CADY, Prof. WALTER GUYTON, 49 High St., Middletown, Conn.....	1916
CAHN, ALVIN R., 4720 Greenwood Ave., Chicago, Ill.....	1917
CALDWELL, GUY C., 630 Oxford St., Cambridge, Mass.....	1920
CALLENDER, JAMES PHILIPS, 45 Wall St., New York, N. Y.....	1903
CALVERT, EARL W., c o. J. W. Noble, Harrow, Ont., Canada.....	1919
CAMBURN, MRS. OSMAN M., 6 Oak Knoll, Arlington 74, Mass.....	1920
CAMPINI, CHAS. A., 154 E. 33rd St., New York, N. Y.....	1919
CANNON, GABRIEL, Spartanburg, S. C.....	1920
CANTWELL, GEO. G., 901 W. Main Ave., Puyallup, Wash.....	1916
CARLISLE, GEORGE L., JR., 178 E. 70th St., New York, N. Y.....	1920
CARPENTER, Rev. C. K., 1724 Sunnyside Ave., Chicago, Ill.....	1894
CARPENTER, GEORGE I., 129 Dean St., Brooklyn, N. Y.....	1907
CARRIGER, H. W., 5185 Trask St., Fruitvale Station, Oakland, Calif.....	1913
CARRYL, FRANK M., 1 Princeton St., Nutley, N. J.....	1919
CARTER, C. M., 702 N. 6th St., St. Joseph, Mo.....	1920

CARTER, JOHN D., Lansdowne, Pa.....	1907
CARTWRIGHT, W. J., 15 Latham St., Williamstown, Mass.....	1920
CASE, Mrs. GEO. B., Englewood, N. J.....	1920
CASH, HARRY A., 420 Hope St., Providence, R. I.....	1898
CASWELL, Mrs. ARTHUR E., 241 Union St., Athol, Mass.....	1918
CHAMBERLAIN, CHAUNCEY W., 36 Lincoln St., Boston, Mass.....	1885
CHAPIN, Miss ANGIE C., 50 Saratoga Ave., Yonkers, N. Y.....	1896
CHAPMAN, Mrs. F. M., Englewood, N. J.....	1908
CHASE, RICHARD MORTON, 164 Westminster R'd, Rochester, N. Y.....	1919
CHASE, SIDNEY, 25 Ames Bldg., Boston, Mass.....	1904
CHEESEMAN, MORTON R., R. D. 1., Rivera, Calif.....	1911
CHEESEMAN, Wm. H., Biological Survey, Washington, D. C.....	1920
CHILDS, Miss HELEN P., Chevy Chase, Md.....	1920
CHILDS, HENRY EVERETT, 864 Broadway, E. Providence, R. I.....	1919
CHRISTIE, EDW. H., 5069 Kensington Ave., St. Louis, Mo.....	1920
CLAGET, CHAS W., Washington College, Chestertown, Md.....	1918
CLARK, ARTHUR L., Forest Home, Rt. 2, Ithaca, N. Y.....	1920
CLARK, AUSTIN HOBART, 1818 Wyoming Ave., Washington, D. C.....	1919
CLARK, CLARENCE H., Lubec, Me.....	1913
CLARK, Miss EMILY L., Box 3, St. Johnsbury, Vt.....	1920
CLARK, JOSEPH P., M. D., 71 Marlborough St., Boston, Mass.....	1920
CLARK, JOSIAH H., 702 E. 23rd St., Paterson, N. J.....	1895
CLARKE, CHARLES E., 51 Summit R'd., Medford, Mass.....	1907
CLARKE, Miss HARRIET E., 9 Chesnut St., Worcester, Mass.....	1896
CLARKE, Miss MARY S., Franklin Sq. Hotel, Washington, D. C.....	1916
CLARKE, Miss ROWENA A., Kirkwood, Mo.....	1919
CLARKE, STANLEY F., 41 Taconic St., Pittsfield, Mass.....	1920
CLEAVES, HOWARD H., Conservation Comm., Albany, N. Y.....	1907
CLEVELAND, Dr. CLEMENT, W. Palm Beach, Fla.....	1903
CLEVELAND, Miss LILIAN, Woods Edge R'd., West Medford, Mass.....	1906
COALE, HENRY K., Highland Park, Ill.....	1883
COBB, Miss ANNIE W., 72 Oxford St., Arlington, Mass.....	1909
COBB, PHILIP HACKER, Loomis Inst., Windsor, Conn.....	1917
COBB, Dr. STANLEY, Ponkapog, Mass.....	1909
CODMAN, JAMES M., 87 Milk St., Boston, Mass.....	1920
COFFIN, Mrs PERCIVAL B., 39 S. La Salle St., Chicago, Ill.....	1905
COFFIN, Robert L., Mass. Agric'l Exp. Sta., Amherst, Mass.....	1917
COGGINS, HERBERT L., 2929 Piedmont Ave., Berkeley, Calif.....	1913
COLBURN, ALBERT E., 806 S. Broadway, Los Angeles, Calif.....	1891
COLE, JOHN L., Rt. 5, Nevada, Iowa.....	1920
COLE, Dr. LEON J., College of Agric., Univ. of Wis., Madison, Wis.....	1908
COMMONS, Mrs. F. W., 608 Cham'r of Commerce, Minneapolis, Minn.....	1902
CONGER, ALLEN C., Box 561, E. Lansing, Mich.....	1919
CONOVER, HENRY B., 6 Scott St., Chicago, Ill.....	1920
COOK, FRANKLIN P., Seaside Hotel, Atlantic City, N. J.....	1920

COOK, FREDERICK, W., 1604 East Harrison St., Seattle, Wash.....	1915
COOK, Miss LILIAN GILLETTE, Long Lea Farm, Amherst, Mass.....	1899
*COOKE, Miss MAY THACHER, 1328 Twelfth St., Washington, D. C.....	1915
COOKMAN, ALFRED, Dept. of Science, Glendale H. S., Glendale, Calif.....	1920
COOLIDGE, PHILIP T., 31 Central St., Bangor, Me.....	1919
COPE, FRANCIS R., JR., Dimock, Pa.....	1892
COPELAND, Miss ADA B., 1103 White Ave., Grand Junction, Colo....	1917
COPELAND, MANTON, 88 Federal St., Brunswick, Me.....	1900
CORDIER, Dr. A. H., 415 Benton Blv'd., Kansas City, Mo.....	1920
COUES, Dr. WM. P., 31 Massachusetts Ave., Boston, Mass.....	1920
COURSEN, BLAIR, 560 Wauwatosa Ave., Wauwatosa, Wis.....	1918
COURT, EDWARD J., 1723 Newton St., N. W., Washington, D. C.....	1919
COVELL, Dr. HENRY H., 1600 East Ave., Rochester, N. Y.....	1918
COX, RODMAN DAYTON, Y. M. C. A., Rochester, N. Y.....	1919
CRAIG, WALLACE, Univ of Maine, Orono, Me.....	1912
CRANDALL, LEE S., N. Y. Zoöl Park, New York, N. Y.....	1909
CRANE, Miss CLARA L., Dalton, Mass.....	1904
CRANE, Mrs. ZENAS, Dalton, Mass.....	1904
Craven, ALLAN B., 3 Spruce St., Boston, Mass.....	1919
CRIDDLE, NORMAN, Treesbank, Man.....	1918
CROCKER, WM. T., 143 E. 35th St., New York, N. Y.....	1920
*CROSBY, MAUNSELL S. Rhinebeck N. Y.....	1904
CROSS ALBERT ASHLEY, Huntington, Mass.....	1918
CROSSMAN, ANNIE F., Mus. Nat. Hist., Pittsfield, Mass.....	1920
CROWELL, Miss J. OLIVIA, Dennis, Mass.....	1918
CUDWORTH, WARREN H., Assonet, Mass.....	1919
CUMMINGS, Miss EMMA G., 16 Kennard Road, Brookline, Mass.....	1903
CUNNINGHAM, J. WALTER, 3009 Dunham Ave., Kansas City, Mo....	1919
CURRIER, EDMONDE SAMUEL, 416 E. Chicago St., Portland, Ore.....	1894
CURRIE, ROLLO P., 632 Keefer Pl., Washington, D. C.....	1895
CURRY, HASKELL BROOKS, 60 Bay State Road, Boston, 17, Mass....	1916
CURTIS, CHARLES P., 244 Beacon St., Boston, Mass.....	1915
CURTIS, ROY Q., JR., 11 W. 76th St., New York, N. Y.....	1919
CUSHMAN, Miss ALICE, 919 Pine St., Philadelphia, Pa.....	1910
CUTTER, Miss LUCIA B., Jaffrey, N. H.....	1920
DALEY, Miss MARY WOOD, Sleighton Farm, Darling P. O., Delaware Co., Pa.....	1920
DANE, Mrs. ERNEST B., Chestnut Hill, Mass.....	1912
DANFORTH, STUART T., 115 N. 6th Ave., New Brunswick, N. J.....	1916
DANIELS, EDWARD S., 3869 A Conn. Ave., St. Louis, Mo.....	1919
DAVENPORT, Mrs. ELIZABETH B., Brattleboro, Vt.....	1898
DAVIES, Miss DOROTHY E., Blackinton, Mass.....	1920
DAVIS, Miss BERTHA E., 22 Cypress Place, Brookline 46, Mass.....	1920
DAVIS, JOHN M., 737 M. St., Eureka, Calif.....	1920
DAVIS, R. N. Everhart Museum, Scranton, Pa.....	1920

DAWSON, Prof. RALPH W., 1105 N. 33rd St., Lincoln, Neb.....	1920
DAY, CHESTER SESSIONS, 15 Custom House St., Boston, Mass.....	1897
DEAN, F. ROY, 3465 S. Spring Ave., St. Louis, Mo.....	1919
DEAN, R. H., 720 Quintard Ave., Anniston, Ala.....	1913
DEANE, GEORGE CLEMENT, 80 Sparks St., Cambridge, Mass.....	1899
DEARBORN, SAMUEL S., 9 Massachusetts Ave., Boston, Mass.....	1919
DELOACH, R. J. H., 10154 Longwood Drive, Chicago, Ill.....	1910
DELURY, Dr. RALPH E., Dominion Observatory, Ottawa, Canada....	1920
DENSMORE, Miss MABEL, 910 4th St., Red Wing, Minn.....	1910
DENT, PAUL, 3714 West Pine B'lv'd, St. Louis, Mo.....	1919
DERBY, RICHARD, Oyster Bay, L. I., N. Y.....	1898
DEWEY, Dr. CHARLES A., 78 Plymouth Ave., Rochester, N. Y.....	1900
DEWIS, Dr. JOHN W., 69 Newberry St., Boston 17, Mass.....	1920
DEXTER, Prof. JOHN SMITH, Univ. Sask., Saskatoon, Sask.....	1919
DEXTER LEWIS, 1889 Elm St., Manchester, N. H.....	1915
DEXTER, Rev. SMITH OWEN, Concord, Mass.....	1920
DICE, LEE RAYMOND, Mus. Zool., Ann Arbor, Mich.....	1918
DICKEY, DONALD R., San Rafael Heights, Pasadena, Calif.....	1907
DILLE, FREDERICK M., Niobrara Reservation, Valentine, Neb.....	1892
DINGLE, EDWARD VON S., Summerton, S. C.....	1920
DINGS, McCLELLAND, 5715 Enright Ave., St. Louis, Mo.....	1919
DIONNE, C. E., Laval University, Quebec, Canada.....	1893
DIXON, FREDERICK J., 111 Elm Ave., Hackensack, N. J.....	1891
DIXON, JOSEPH S., Univ. of Calif., Berkeley, Calif.....	1917
DOANE, GILBERT HARRY, The Elms, Fairfield, Vt.....	1919
DOBROSKY, Miss IRENE, 120 Oak Ave., Ithaca, N. Y.....	1920
DONAHUE, RALPH J., Bonner Springs, Kan.....	1919
DRAPER, WALLACE S., Wayland, Mass.....	1920
DRIER, THEODORE, 35 Remsen St., Brooklyn, N. Y.....	1919
DRUMMOND, Miss MARY, 510 Spring Lane, Lake Forest, Ill.....	1904
DUANE, ARTHUR, "Cool Gales," Sharon, Conn.....	1920
DUBOIS, ALEXANDER D., 327 S. Glenwood Ave., Springfield, Ill....	1918
DULL, Mrs. A. P. L., 211 N. Front St., Harrisburg, Pa.....	1900
DUNBAR, Miss LULA, R. D. 1, Elkhorn, Wis.....	1918
DUNHAM, Miss LUCINDA H., 34 Crandall St., Adams, Mass.....	1920
DUNN, Mrs. H. A., Rt. 3, Box 63, Athol, Mass.....	1920
DURAND, Miss LAURA B., 11 Oriole Gardens, Toronto, Ont.....	1919
DURFEE OWEN, Box 125, Fall River, Mass.....	1887
DURYEA, Miss ANNIE B., 62 Washington St., Newark, N. J.....	1911
DYKE, ARTHUR CURTIS, 205 Summer St., Bridgewater, Mass.....	1902
EADIE, GUY L., Berwyn, Pa.....	1920
EARL, D. OSBOURNE, 17 Bates St., Cambridge, Mass.....	1919
EASTMAN, Major FRANCIS B., Camp Grant, Ill.....	1909
EASTMAN, Miss SARAH C., 51 Chapel St., Portland, Me.....	1920
*EATON, HOWARD, Wolf, Sheridan Co., Wyo.....	1918

EATON, Miss MARY S., 8 Monument St., Concord, Mass.....	1909
EATON, SCOTT HARRISON, Box 653, Lawrenceville, Ill.....	1912
EDSON, JOHN M., Marietta Road, Bellingham, Wash.....	1886
EDSON, WM. L. G., 54 Fairview Ave., Rochester, N. Y.....	1916
EDWARDS, KATHERINE M., Wellesley College, Wellesley, Mass.....	1918
EHINGER, Dr. CLYDE E., 100 W. Rosedale Ave., West Chester, Pa....	1904
EHRIG, Prof. C. W. GUSTAVE, 504 Monroe Ave., Oak Park, Ill.....	1901
EMBECK, Dr. AUGUST F., New Haven, Mo.....	1906
EKBLAW, WALTER ELMER, 601 N. Willis Ave., Champaign, Ill.....	1911
ELIOT, WILLARD AYRES, 1011 Thurman St., Portland, Ore.....	1918
ELLIOT, Miss SARAH J., Union Hospital, Terre Haute, Ind.....	1920
ELLS, GEORGE P., Norwalk, Conn.....	1904
EMERSON, W. OTTO, Hayward, Calif.....	1916
EMMERICH, ROBERT D., 322 W. 100th St., New York, N. Y.....	1919
ENGLISH, Mrs. T. F., 3631 Campbell St., Kansas City, Mo.....	1919
ENO, HENRY LANE, Princeton, N. J.....	1918
ERICHSEN, W. J., 2311 Barnard St., Savannah, Ga.....	1919
ESLUCK, Miss AUGUSTINE W., 58 Highland Ave., Greenfield, Mass..	1920
EVANS, Dr. EVAN M., 550 Park Ave., New York, N. Y.....	1916
EVANS, FRANK C., Crawfordsville, Ind.....	1919
EVANS, WILLIAM B., Moorestown, N. J.....	1897
EYER, GEO. A., Short Hills, N. J.....	1918
FAIRMAN, Miss MARIAN, 4744 Kenwood Ave., Chicago, Ill.....	1920
FALGER, Mrs. WM., c o. California Nat'l Bank, Modesto, Calif....	1918
FARLEY, FRANK L., Camrose, Alberta.....	1920
FARRAR, CLARENCE D., 63 Eastern Ave., Lewiston, Me.....	1920
FAXON, ALLAN HART, 7 Edwards St., Southbridge, Mass.....	1916
FAY, S. PRESCOTT, 53 State St., Boston, Mass.....	1907
FELGER, ALVA HOWARD, North Side High School, Denver, Colo....	1898
FELL, Miss EMMA TREGO, 1534 N. Broad St., Philadelphia, Pa.....	1903
FERGUSON, HARRY L., Old Church Road, Greenwich, Conn.....	1920
FIELD, Dr. GEORGE W., 2807 18th St., N. W., Washington, D. C....	1910
FIELD, WM. L. W., Milton Acad., Milton, Mass.....	1920
FISHER, Miss ELIZABETH WILSON, 2222 Spruce St., Philadelphia, Pa.	1896
FISHER, Dr. G. CLYDE, American Mus. Nat. Hist., New York, N. Y.	1908
FITZPATRICK, Wm. J., c/o. Brown, Durrell Co., 104 Kingston St., Boston, Mass.....	1920
FLEISHER, EDWARD, 1074 New York Ave., Brooklyn, N. Y.....	1916
FLETCHER, LYLE, Norton, Kan.....	1919
FLETCHER, Mrs. MARY E., Proctorsville, Vt.....	1898
FLOYD, CHARLES BENTON, 382 Wolcott St., Auburndale, Mass.....	1916
FOLSOM, Miss IDA M., Normal School, Presque Isle, Me.....	1920
FOOT, Dr. NATHAN CHANDLER, Readville, Mass.....	1916
FORBES, RALPH E., 328 Adams St., Milton, Mass.....	1917
FORD, EDWARD R., 4741 Brecon St., Chicago, Ill.....	1920

FORD, LEE M., Box 8, Great Falls, Mont.....	1919
FORD, Miss LOUISE PETIGRU, "The Heights," Aiken, S. C.....	1919
FORDYCE, GEO. L., 40 Lincoln Ave., Youngstown, Ohio.....	1901
FORTNER, Prof. HARRY C., Univ. Tennessee, Knoxville, Tenn.....	1920
*FOSTER, FRANCIS A., Edgartown, Mass.....	1918
FOSTER, FRANK B., Haverford, Pa.....	1916
FOTHERGILL, Miss E. R., 208 S. Whitney St., Hartford, Conn.....	1920
FOWLER, FREDERICK HALL, 221 Kingsley Ave., Palo Alto, Calif.....	1892
FOWLER, HENRY W., Acad. Nat. Sciences, Philadelphia, Pa.....	1898
FOX, Dr. WILLIAM H., 1826 Jefferson Place, Washington, D. C.....	1883
FRANCIS, NATHANIEL A., 35 Davis Ave., Brookline, Mass.....	1914
FRASER, DONALD, Johnstown, N. Y.....	1902
FREEMAN, Dr. C. D., Box 113, Medina, Ohio.....	1920
FREEMAN, Prof. DANIEL, 711 7th St., S., Fargo, N. D.....	1920
FREEMAN, Miss HARRIET E., 37 Union Park, Boston, Mass.....	1903
FRENCH, CHARLES H., Canton, Mass.....	1904
FRENCH, Mrs. CHAS H., Canton, Mass.....	1908
FROST, ALLEN, c. o. Trussell Mfg. Co., Poughkeepsie, N. Y.....	1919
FROTHINGHAM, Mrs. RANDOLPH, 113 Commonwealth Ave., Boston, Mass.....	1913
FRY, Rev. HENRY J., 88, 27th St., Elmhurst, L. I., N. Y.....	1916
*FUGUET, HOWARD, 312 Bullitt Bldg., Philadelphia, Pa.....	1919
FULLER, HENRY C., 1348 Euclid St., Washington, D. C.....	1916
FULLER, Mrs. T. OTIS, Needham, Mass.....	1909
GAGE, ARTHUR, Camp Douglas, Rt. 2, Box 36, Wisconsin.....	1920
GANIER, ALBERT F., 2507 Ashwood Ave., Nashville, Tenn.....	1917
GARDINER, CHARLES BARNES, 175 W. Main St., Norwalk, Ohio.....	1903
GARDNER, ASTON COLEBROOK, 1805 Market St., Wilmington, Del....	1919
GARDNER, Mrs. E. P., 140 Gibson St., Canandaigua, N. Y.....	1920
GARDNER, JAMES H., 626 Kennedy Bldg., Tulsa, Okla.....	1919
GARDNER, Mrs. W. H., Bucksport, Me.....	1920
GARST, Dr. JULIUS, 29 Oread St., Worcester, Mass.....	1916
GASTON, Dr. P. K., Pratt, Kan.....	1919
GERTH, WALTER G., 3929 Greenview Ave, Chicago, Ill.....	1918
GERTKEN, Prof. SEVERIN, St. John's University, Collegeville, Minn..	1912
GIANINI, CHAS A., Poland, N. Y.....	1911
GIBSON, LANDGON, 5 Union St., Schenectady, N. Y.....	1887
GILBERT, Mrs. F. M. Walpole, N. H.....	1919
GILCHRIST, Mrs. D. A., 1519 W. Washington St., Phoenix, Ariz.....	1920
GILLIAM, ROBERT A., Southwestern Bldg., Dallas, Texas.....	1920
GILMAN, M. FRENCH, Banning, Calif.....	1907
GLADDING, Mrs. JOHN R., 30 Stimson Ave., Providence, R. I.....	1912
GLEASON, Mrs. C. H., 700 Madison Ave., S. E., Grand Rapids, Mich.	1917
GLOYD, HOWARD K., Wellsville, Kan.....	1920
GOELITZ, WALTER A., 170 Nunda Boulevard, Rochester, N. Y.....	1916

GOLSAN, LEWIS S., Box 97, Prattville, Ala.....	1912
GOODE, Mrs. F. B., Sharon, Mass.....	1918
GOODRICH, Miss JULIET T., State Line, Vilas County, Wis.....	1904
GORDON, HARRY E., 307 Laburnum Cres., Rochester, N. Y.....	1911
GORMLEY, A. LIGNORI, Box 345, Arnprior, Ont.....	1918
GORST, CHARLES C., 28 Beauford R'd., Jamaica Plain, Boston, Mass.....	1916
GOULD, JOSEPH E., Barbourville, Ky.....	1889
GOWANLOCK, J. NELSON, Dept. Zool. Univ. Chicago, Chicago, Ill....	1919
GOWDY, EARL R., Box 646, Beacon Falls, Conn.....	1920
GRAHAM, HOB. WM. J., Aledo, Ill.....	1909
GRANGE, WALLACE B., Ladysmith, Wis.....	1920
GRANGER, WALTER, Amer. Mus. Nat. Hist., New York, N. Y.....	1891
GRANT, Mrs. ADELE L., Dept. Botany, Cornell Univ., Ithaca, N. Y.....	1919
GRANT, WM. W., 600 Castle St., Geneva, N. Y.....	1910
GRAVES, Miss BESSIE M., 15 Chapman Ave., Easthampton, Mass....	1920
GRAVES, Mrs. CHARLES B., 4 Mercer St., New London, Conn.....	1905
GRAY, GEORGE, Greenvale, Poughkeepsie, N. Y.....	1920
GRAY, GEORGE M., Box 89, Woods Hole, Mass.....	1916
GREANOFF, Rev. A. E., 220 Montgomery Ave., W. Pittston, Pa.....	1919
GREEN, HORACE OAKES, 114 North Ave., Wakefield, Mass.....	1917
GREENLAW, JOS. M., 28 Budleigh St., Beverly, Mass.....	1920
GREENOUGH, HENRY VOSE, 1134 Beacon St., Brookline, Mass.....	1901
GREGORY, STEPHEN S., JR., 456 Surf St., Chicago, Ill.....	1916
GRIFFEE, WILLET E., Route 3, Corvallis, Ore.....	1919
GRIFFIN, BERTRAM S., 22 Currie Ave., Haverhill, Mass.....	1917
GROSS, Dr. ALFRED O., Bowdoin College, Brunswick, Me.....	1907
GROSVENOR, Miss LULU E., 304 Mass. Ave., Washington, D. C.....	1920
GUINOTTE, Judge JULES E., 1215 Manheim R'd., Kansas City, Mo....	1919
GUNTHERP, Prof. HORACE, 2107 E. 55th St., Univ. of Wash., Seattle, Wash.....	1919
HAAS, ROBERT C., 504 Sweetland Bldg., Cleveland, Ohio.....	1919
HADLEY, ALDEN H., Monrovia, Ind.....	1906
HADELER, E. W., 520 So. State St., Painesville, Lake Co., Ohio.....	1920
HAGAR, J. A., Marshfield Hills, Mass.....	1914
HAILE, H. PENNINGTON, 28 Edwards St., Springfield, Mass.....	1919
HALL, F. GREGORY, Univ. of Wisconsin, Madison, Wis.....	1917
HALL, WM. WEBSTER, JR., 15 E. 75th St., New York, N. Y.....	1917
HALLINAN, THOMAS, 212 Madison Ave., Paterson, N. J.....	1919
HALLINAN, JOSEPH E., Coopertown, Okla.....	1919
HAMILTON, Dr. BAKER A., Highland Park, Ill.....	1920
HANDLEY, CHAS. O., Lewisburg, W. Va.....	1916
HANKINSON, THOS. L., N. Y. College of Forestry, Syracuse, N. Y....	1897
HANNA, G. DALLAS, California Acad. Sci., San Francisco, Calif.....	1919
HANNA, WILSON CREAL, 1000 Pennsylvania Ave., Colton, Calif.....	1919
HANNUM, WILLIAM E., Primos, Delaware Co., Pa.....	1920

HARDISTY, ARTHUR H., 2326 First St., N. W., Washington, D. C.	1918
HARDON, Mrs. HENRY W., Wilton, Conn.	1905
HARPER, SAMUEL A., 230 N. Kingston Ave., River Forest, Ill.	1920
HARRINGTON, Mrs. A. B., Lincoln, Mass.	1919
HARRINGTON, RALPH M., 595 Ashland Ave., Buffalo, N. Y.	1915
*HARRISON, GEO. L., JR., 400 Chestnut St., Philadelphia, Pa.	1919
HARRISON, HARRY MORGAN, 503 Linden St., Camden, N. J.	1919
HART, Miss HELEN, Williamstown, Mass.	1920
HARTLEY, GEO. INNESS, 344 W. 87th St., New York, N. Y.	1919
HARTSHORN, HAROLD IRA, 53 S. 12th St., Newark, N. J.	1918
HARVEY, JOHN L., 3 Moody St., Waltham, Mass.	1916
HASBROUCK, HENRY C., 2151 12th St., Troy, N. Y.	1920
HASKELL, Miss SADIA, 1236 11th St., N. W., Washington, D. C.	1916
HATHAWAY, Mrs. E. L., Spring St., R. D. 1, W. Bridgewater, Mass.	1920
HATHAWAY, HARRY S., Box 1466, Providence, R. I.	1897
HAVEMEYER, H. O., Mahwah, N. J.	1893
HAVEMEYER, H. O., Jr., Mahwah, N. J.	1919
HAVEN, HERBERT, M. W., 500 Forest Ave., Portland, Me.	1920
HAWES, Dr. EDWARD E., Hyannis, Mass.	1920
HAWK, JOHN L., 5843 Plymouth Ave., St. Louis, Mo.	1920
HEACOCK, ESTHER, Wyncote, Pa.	1918
HEALEY, ALDEN P., 2006 Northampton St., Holyoke, Mass.	1919
HEATH, Miss CHARLOTTE M., Box 76, Easton, Mass.	1920
HEDGES, CHAS. F., 1505 Pearl St., Miles City, Mont.	1919
HELME, ARTHUR H., Miller Place, N. Y.	1888
HEMENWAY, AUGUSTUS, Tavern Club, Boylston Pl., Boston, Mass.	1920
HEMPEL, Miss KATHLEEN, Elkader, Iowa.	1919
HEMPHILL, ASHTON ERASTUS, Holyoke, Mass.	1919
HENDERSON, HARLIN C., Carpinteria, Santa Barbara Co., Calif.	1920
*HENDERSON, J. B., 16th St., & Florida Ave., N. W., Washington, D. C.	1918
HENDERSON, Judge JUNIUS, 627 Pine St., Boulder, Colo.	1903
HENDERSON, WALTER C., 4727 13th St., N. W., Washington, D. C.	1917
HENDRICKSON, W. F., 276 Hillside Ave., Jamaica, N. Y.	1885
HENNESSEY, FRANK C., 457 Albert St., Ottawa, Ont.	1914
HERMANN, THEODORE L., 273 Neal Dow Ave., New Brighton, N. Y.	1916
*HERRICK, HAROLD, 123 William St., New York, N. Y.	1905
HERRICK, NEWBOLD L., 60 Wall St., New York, N. Y.	1913
HERRICK, N. LAWRENCE, Cedarhurst, N. Y.	1917
HILL, JAMES HAYNES, Box 485, New London, Conn.	1897
HILL, Mrs. THOMAS R., Box 491, Chautauqua, N. Y.	1903
HIMMAL, WALTER J., Radelcliff, Iowa.	1920
HINCKLEY, GEO. LYMAN, Redwood Library, Newport, R. I.	1912
HINE, Prof. JAMES STEWART, Ohio State Univ., Columbus, Ohio.	1899
HITCHCOCK, Mrs. WILLARD C., 60 Central St., Palmer, Mass.	1920

HIX, GEORGE E., 100 W. 91st St., New York, N. Y.....	1904
HOLLAND, HAROLD MAY, Galesburg, Ill.....	1910
HOLLAND, R. P., 2273 Woolworth Bldg., New York, N. Y.....	1920
HOLLAND, DR. WILLIAM J., Carnegie Museum, Pittsburgh, Pa.....	1899
HOLLISTER, G. B., 4 E. 5th St., Corning, N. Y.....	1919
HOLLISTER, WARREN D., 510 McPhee Bld., Denver, Colo.....	1901
HOLMAN, RALPH H., 25 Livermore Rd., Wellesley Hills, Mass.....	1907
HOLT, ERNEST G., c. o. Miss Olivia Holt, 312 Bell Bldg., Montgom- ery, Ala.....	1911
HONYWILL, ALBERT W., Jr., 211 Ridgefield St., Hartford, Conn.....	1907
HORSFALL, ROBERT BRUCE, 1457 E. 18th St., Portland, Ore.....	1905
HORSEY, RICHARD E., Highland P'k., Reservoir Ave., Rochester, N. Y.,.....	1919
HOTCHKISS, NEIL, Marcellus, N. Y.....	1919
HOUGHTON, CLARENCE, 533 Washington Ave., Albany, N. Y.....	1920
HOWLAND, R. H., 164 Wildwood Ave., Upper Montclair, N. J.....	1903
HOYT, WILLIAM H., Box 425, Stamford, Conn.....	1907
HUBBARD, C. ANDRESEN, 287 E. 44th St., Portland, Ore.....	1916
HUBBARD, PROF. MARIAN E., 15 Appleby Road, Wellesley, Mass.....	1916
HUBBARD, RALPH, 1038 University Ave., Boulder, Colo.....	1916
HUBER, WHARTON, 225 St. Marks Sq., Philadelphia, Pa.....	1915
HUEY, L. M., Nat. Hist. Mus., Balboa Park, San Diego, Calif.....	1920
HUGHES, GEO. T., Watchung, N. J.....	1919
HUGHES, DR. WILLIAM E., 3945 Chestnut St., Philadelphia, Pa.....	1920
HUNN, JOHN T. SHARPLESS, 1218 Prospect Ave., Plainfield, N. J.....	1895
HUNT, CHRESWELL JOHN, 5847 W. Superior St., Chicago, Ill.....	1919
HUNT, MISS LUCY O., 185 Beacon St., Hartford, Conn.....	1919
HUNT, RICHARD M., Mus. Vert. Zoöl., Berkeley, Calif.....	1918
HURD, MISS FRANCES A., 43 West Ave., S. Norwalk, Conn.....	1919
HUSHER, MRS. GERTRUDE H., 821 S. Hope St., Los Angeles, Calif.....	1918
HYDE, MRS. S. E., Regina, Idaho.....	1918
HYSLOP, SAMUEL, 42 Bellevue St., Newton, Mass.....	1919
INGERSOLL, ALBERT M., 908 F St., San Diego, Calif.....	1885
ISHAM, CHAS B., 50 W. 67th St., New York, N. Y.....	1891
JACKSON, DR. HARTLEY H. T., Biological Survey, Washington, D. C.....	1910
JACKSON, JOHN W., Belchertown, Mass.....	1920
JACKSON, RALPH W., R. D. 1, Cambridge, Md.....	1918
JACKSON, THOMAS H., 304 N. Franklin St., West Chester, Pa.....	1888
JAMES, NORMAN, Catonsville, Md.....	1913
JAMES, THOMAS A., Augusta, Me.....	1920
JANVRIN, DR. E. R. P., 515 Park Ave., New York, N. Y.....	1919
JENKS, CHAS W., Bedford, Mass.....	1912
JENNEY, HOR. CHARLES F., 100 Gordon Ave., Hyde Park, Mass.....	1905
JENNINGS, DR. GEO. H., Jewett City, Conn.....	1918
JENNINGS, RICHARD D., 129 Harrison St., East Orange, N. J.....	1913

JENSEN, J. K., U. S Indian School, Santa Fé, N. Mex.....	1912
JEWETT, STANLEY G., 582 Bidwell, Portland, Ore	1906
JOHNSON, Prof. CHAS. E., Dept. Zoöl., Kan. Univ., Lawrence, Kan.	1919
JOHNSON, FRANK E., 16 Amackassin/Terrace, Yonkers, N. Y.....	1888
JOHNSON, REGINALD M., 60 State St., Boston, Mass.....	1920
JOHNSON, WARD L., Lawrence School, Hewlett, Long Island, N. Y... ..	1920
JOHNSTONE, WALTER B., Edgewood, Arrow Lake, B. C.....	1920
JONES, Dr. LOMBARD CARTER, Falmouth, Mass.....	1917
JONES, S. PAUL, 207 W. Washington Ave., Madison, Wis.....	1920
JONES, WILLIAM F., Norway, Me.....	1918
JORDAN, A. H. B., Everett, Wash.....	1888
JUMP, Mrs. EDWIN R., 97 Oakleigh Road, Newton, Mass.....	1910
KAEDING, GEO. L., Cortez, Lander Co., Nev.....	1918
KANE, Mrs. SUSAN MARY, Mich. Club Bldg., Seattle, Wash.....	1919
KEE, HUNTER, Marlinton, W. Va.....	1920
KELLOGG, RALPH T., Silver City, N. M.....	1913
KELSO, Dr. JOHN E. H., Edgewood, Lower Arrow Lake, B. C.....	1915
KENISTON, ALLAN, Vineyard Haven, Mass.....	1917
KENNEDY, EDWARD H., South Easton, Mass.....	1920
KENNEDY, Dr. HARRIS, Readville, Mass.....	1916
*KENNEDY, HARRY H., 105 Vine St., Reno, Nev.....	1920
KENT, DUANE E., 47 West St., Rutland, Vt.....	1913
KENT, EDWARD G., 2595 Boulevard, Jersey City, N. J.....	1919
KENT, EDWIN C., 156 Boadway, New York, N. Y.....	1907
KESSEL, MARCEL H., 659 Auburn Ave., Buffalo, N. Y.....	1920
KEAYS, JAMES E., 328 St. George St., London, Ontario.....	1899
*KIDDER, NATHANIEL T., Milton, Mass.....	1906
KILGORE, WILLIAM, Jr, 1700 Stevens Ave, Minneapolis, Minn ...	1906
KINGSBURY, FREDERICK S., 97 Oliver St., Boston, Mass.....	1916
KING, LeROY, 20 E. 84th St., New York, N. Y.....	1901
KING, MARK HUNTINGTON, 107 Elm Hill Ave., Boston, 21, Mass....	1920
KINGMAN, ROBERT H., 11 S. Cedar Ave., Arverne, N. Y.....	1919
KIRKHAM, Mrs. JAMES W., 275 Maple St., Springfield, Mass.....	1904
*KIRKHAM, STANTON D., 152 Howell St., Canandaigua, N. Y.....	1910
KIRKWOOD, FRANK C., R. F. D., 3, Monkton, Md.....	1892
*KIRN, ALBERT J. B., R. F. D. 4, Solomon, Kan.....	1918
KITTREDGE, JOSEPH, Jr., Forest Service, Washington, D. C.....	1910
KLOSEMAN, Miss J. E., Beal Hall, 20 Charlesgate W., Boston, Mass.	1909
KLOTS, ALEXANDER, 125 W. 78th St., New York, N. Y.....	1919
KNAEBEL, ERNEST, 3707 Morrison St., Chevy Chase, D. C.....	1906
KNOLHOFF, FERDINAND WILLIAM, Amityville, N. Y.....	1890
KREHBIEL, LEONARD, W. 10th St., Upland, Calif.....	1920
KRETZMAN, Prof. P. E., 3705 Texas Ave., St. Louis, Mo.....	1913
KUBICHEK, D. P., Biological Survey, Washington, D. C.....	1919
KUSER, ANTHONY R., Bernardsville, N. J.....	1908

KUSER, Mrs. ANTHONY R., Bernardsville, N. J.....	1910
KUSER, JOHN DRYDEN, Bernardsville, N. J.....	1910
LABARTHE, JULES, 85 2nd St., San Francisco, Calif.....	1920
LABRIE, JOSEPH D., 1717 E. 78th St., Kansas City, Mo.....	1913
LACEY, HOWARD GEORGE, R. F. D. 1, Kerrville, Texas.....	1892
LADD, HARRY STEPHEN, 4354 McPherson Ave., St. Louis, Mo.....	1919
LADOW, STANLEY V., 622 W. 113th St., New York, N. Y.....	1919
LAING, HAMILTON M., 1277 E. 32nd St., Portland, Ore.....	1917
LAMB, CHAS R., 8 Highland St., Cambridge, Mass.....	1910
LANCASHIRE, Mrs. JAMES HENRY, 7 East 75th St., New York, N. Y.....	1908
LANG, HERBERT, Amer. Mus. Nat. Hist., New York, N. Y.....	1997
LANGDON, ROY M., Littleton, Colo.....	1919
LANO, ALBERT, Fayetteville, Ark.....	1917
LARRABEE, Prof. AUSTIN P., Yankton College, Yankton, S. Dak.....	1918
LASTRETO, C. B., 260 California St., San Francisco, Calif.....	1919
LATHAM, ROY, Orient, N. Y.....	1916
LAUGHLIN, Miss EMMA E., 127 Walnut St., Barnesville, Ohio.....	1920
LAUGHLIN, J. A., Marshall, Mo.....	1919
LAURENT, PHILIP, 31 E. Mt. Airy Ave., Philadelphia, Pa.....	1902
LAWRENCE, A. G., City Health Dept., Winnipeg, Man.....	1920
LAWSON, RALPH, 88 Washington Sq. East, Salem, Mass.....	1917
LEARNED, Miss AGNES M., Wilkins St., Hudson, Mass.....	1920
LEAVITT, Mrs. FLORENCE R., 42 Forest St., Lexington, Mass.....	1919
LEE, Mrs. L. W., El Cajon, San Diego Co., Calif.....	1920
LEFFINGWELL, DANA J., Aurora, N. Y.....	1919
LEISTER, CLAUDE W., McGraw Hall, Ithaca, N. Y.....	1916
LENGERKE, JUSTUS VON, 211 Highland Ave., Orange, N. J.....	1907
LEONHARD, W. J., Shoreham, Vt.....	1920
LEOPOLD, NATHAN F., Jr., 4754 Greenwood Ave., Chicago, Ill.....	1916
LEVEY, Mrs. WILLIAM, Alton Bay, N. H.....	1915
LEWIS, GEORGE P., 4559 Forrestville Ave., Chicago, Ill.....	1920
LEWIS, HARRISON F., Bergerville, Quebec, Canada.....	1912
LEWIS, Mrs. HERMAN E., 180 Grove St., Haverhill, Mass.....	1912
LIBBEY, ROBERT M., 520 New York Ave., N. W., Washington, D. C.....	1920
LIGHTFOOT, WILLIAM G., 197 Gilesen St., Canandaigua, N. Y.....	1920
LIEBOLD, ERNEST G., 94 Rhode I. Ave., Highland Park, Mich.....	1918
LIGON, J. STOKLEY, Box 131, Albuquerque, New Mexico.....	1912
LINCOLN, FREDERICK CHARLES, Biological Survey, Washington, D. C.....	1910
LINDSAY, Dr. D. MOORE, 808 Boston Block, Salt Lake City, Utah.....	1919
LINGS, GEO. H., Richmond Hill, Cheadle, Cheshire, England.....	1913
LINK, HENRY A., P. O. Box 76, Waterloo, Ind.....	1920
LITTLE, LUTHER, 2nd, 1403 Garfield Ave., So. Pasadena, Calif.....	1913
LLOYD, HOYES, 406 Queen St., Ottawa, Canada.....	1916
LOCKE, Dr. EDWIN A., 311 Beacon St., Boston, Mass.....	1920
LONG, CHAS. IRVING, 130 5th Ave., Roselle, N. J.....	1918

LONG, HARRY V., 260 Clarendon St., Boston, Mass.....	1920
LORD, J. ANDERSON, 13 Ash St., Danvers, Mass.....	1919
LORD, THOMAS HENRY, Newington, N. H.....	1916
LORING, J. ALDEN, Owego, N. Y.....	1917
LOTHROP, DR. OLIVER A., Waban, Mass.....	1920
LOW, ETHELBERG I., 120 Broadway, New York, N. Y.....	1907
LUCE, MRS. FRANCIS P., Box 216, Vineyard Haven, Mass.....	1912
LUCE, MATTHEW, Cohasset, Mass.....	1920
LUM, EDWARD H., Chatham, N. J.....	1904
LUNN, MISS LULU M., 724 Villa St., Racine, Wis.....	1920
LUNN, MISS MARGARET A., 131 A-B Govt. Hotels, Washington, D. C.....	1919
LYNCH, JOSEPH, 400 Washington St., Perth Amboy, N. J.....	1920
MACKINTOSH, RICHARDS B., 5 Howard Ave., Peabody, Mass.....	1919
MACLAY, MARK W., Jr., 106 E. 85th St., New York, N. Y.....	1905
MACCOY, CLINTON V., 1244 Beacon St., Brookline, Mass.....	1920
MACLEAN, MISS MAE, 2116 Evans St., Cheyenne, Wyo.....	1920
MACREYNOLDS, GEORGE, 76 E. State St., Doylestown, Pa.....	1917
MADDOCK, MISS EMELINE, Monte Vista, Philadelphia, Pa.....	1897
MADISON, HAROLD LESTER, Park Museum, Providence, R. I.....	1912
MAGEE, M. J., 603 South St., Sault Ste. Marie, Mich.....	1919
MAHER, J. E., 351 Communipaw Ave., Jersey City, N. J.....	1902
MAIN, FRANK H., Pittsfield, Mass.....	1913
MARBLE, RICHARD M., Woodstock, Vt.....	1907
MARCKRES, GEO. M., Sharon, Conn.....	1918
MARKS, EDWARD SIDNEY, 655 Kearney Ave., Arlington, N. J.....	1915
MARRS, MRS. KINGSMILL, 9 Commonwealth Ave., Boston, Mass.....	1903
MARSHALL, ALFRED, 17 S. Jefferson St., Chicago, Ill.....	1916
*MARSHALL, MRS. ELLA M. O., New Salem, Mass.....	1912
MARTENET, MARK S., Alexander Fertilizer Co., Alexandria, Va.....	1919
MATHEWS, F. SCHUYLER, 17 Frost St., Cambridge, Mass.....	1917
MATTERN, EDWIN S., 1042 Walnut St., Allentown, Pa.....	1912
MAY, FRANKLIN H., 807 E. Adams St., Syracuse, N. Y.....	1920
MAYFIELD, DR. GEORGE R., Kissam Hall, Nashville, Tenn.....	1917
MCCABE, T. T., 6 Thompson St., Annapolis, Md.....	1920
MCCCLINTOCK, NORMAN, 504 Amberson Ave., Pittsburgh, Pa.....	1900
MCCLOSKEY, MISS KATE A., Sup't. Nat. Study in Schools, Saratoga Springs, N. Y.....	1919
MCCONNELL, T. L., 151 Center Ave., Ernsworth, Pittsburgh, Pa.....	1915
MCCOOK, PHILIP J., 413 E. 57th St., New York, N. Y.....	1895
MCGRAW, HARRY A., 1805 15th Ave., Altoona, Pa.....	1917
MCGREW, ALBERT D., 5611 Stanton Ave., Pittsburgh, Pa.....	1917
MCILHENNY, EDWARD AVERY, Avery Island, La.....	1894
MCINTIRE, MRS. HERBERT BRUCE, 4 Garden St., Cambridge, Mass.....	1908
McLAIN, ROBERT BAIRD, Market and 12th St., Wheeling, W. Va.....	1893
McLEAN, Hon. GEO. P., 1520 New Hampshire Ave., Washington, D. C.....	1913

McLELLAN, Miss MARY E., 2935 Pine Ave., Berkeley, Calif.....	1920
McMILLAN, Mrs. GILBERT N., Gorham, N. H.....	1902
McMULLEN, T. E., 551 Bailey St., Camden, N. J.....	1920
McNEIL, Dr. CHAS. A., Sedalia, Mo.....	1919
McNEIL, GEORGE M., 195 Lincoln St., Winthrop, Mass.....	1920
McPHAIL, FRANK L., 1315 Hill St., Ann Arbor, Mich.....	1920
MEAD, Mrs. E. M., 303 W. 84th St., New York, N. Y.....	1904
MEANS, CHAS. J., 29 Marlborough St., Boston, Mass.....	1912
MEDSGER, OLIVER P., 9 Columbia Ave., Arlington, N. J.....	1919
MELLEN, ELEANOR, M. D., 291 Lake Ave., Newton Highlands, Mass.....	1920
MENGEL, G. HENRY, 739 Madison Ave., Reading, Pa.....	1913
MENNINGER, WM. C., 106 23rd St., Elmhurst, L. I., N. Y.....	1919
MERCUR, J. WATTS, Jr., Wallingford, Pa.....	1920
MERRIAM, HENRY F., 37 Clinton Ave., Maplewood, N. J.....	1905
MERRILL, ALBERT R., Hamilton, Mass.....	1912
MERRILL, D. E., Guthrie Center, Ia.....	1913
MERRILL, HARRY, 316 State St., Bangor, Maine.....	1883
MERRIMAN, R. OWEN, 96 W. 2nd St., Hamilton, Ont.....	1920
*MERSHON, W. B., Saginaw, Mich.....	1905
METCALF, F. P., Biological Survey, Washington, D. C.....	1917
METCALF, Z. P., N. C. State College, West Raleigh, N. C.....	1913
MEYER, Major G. RALPH, 56 C. A. C., Camp Jackson, S. C.....	1913
MEYER, Miss HELOISE, Lenox, Mass.....	1913
MICHAELS, WM. C., 645 W. 56th St., Kansas City, Mo.....	1919
MICKEL, Prof. CLARENCE E., Rocky Ford, Colo.....	1920
MIDDLETON, R. J., Jeffersonville, Pa.....	1920
MILLER, Miss BERTHA STUART, Castone Farm, R. 3, Kingston, N. Y.....	1915
MILLER, Miss CARRIE ELLA, 36 Cottage St., Lewiston, Me.....	1918
MILLER, CHAS. W., Jaffna College, Jaffna, Ceylon.....	1909
MILLER, Mrs. ELISABETH C. T., 1010 Euclid Ave., Cleveland, O.....	1916
MILLS, ENOS A., Estes Park, Colo.....	1916
MILLS, WIER R., Pierson, Iowa.....	1920
MINER, LEO D., 1836 Vernon St., N. W., Washington, D. C.....	1913
MITCHELL, CATHERINE ADAMS, Riverside, Ill.....	1911
MITCHELL, HORACE HEADLEY, Provincial Mus., Regina, Sask.....	1918
MITCHELL, MASON, U. S. Consul, Queenstown, Ireland.....	1916
MITCHELL, Dr. WALTON I., Paonia, Delta Co., Colo.....	1893
MOODY, A. J., c. o. Aetna Life Ins. Co., Hartford, Conn.....	1918
MOODY, Dr. WM. LADD, Newport, R. I.....	1918
MOORE, Mrs. DWIGHT, Cedar Hill, Closter, N. J.....	1920
MOORE, ELIZABETH PUTNAM, North Anson, Me.....	1905
MOORE, WILLIAM H., Mouth Kiswick, Rt. 1, York Co., N. Brunswick.....	1920
MORCOM, G. FREAN, 2906 Pine Ave., Berkeley, Calif.....	1886
MORGAN, BRENT M., 224 11th St., S. W., Washington, D. C.....	1919
MORLEY, S. GRISWOLD, 2535 Etna St., Berkeley, Calif.....	1911

MORLOCK, LOUIS F., Creve Coeur, Mo.	1919
MORRIS, Miss LUCY N., 90½ Midland Ave., Montclair, N. J.	1920
MORRISON, ALVA, 3 Shady Hill, Cambridge, Mass.	1915
MORRISON, THADDEUS D., 891 Park St., Hartford, Conn.	1920
MORROW, Miss EDITH, 255 Mance St., Montreal, Canada.	1920
MORSE, GEO. F., Jr., Grove Hall, Mass.	1919
MORSE, HARRY GILMAN, Huron, Ohio.	1912
MORSE, Miss M. E., 3513 Bloomington Ave., Minneapolis, Minn.	1919
MORSS, CHAS. B., 35 Greanleaf St., Bradford, Mass.	1918
MOSELEY, Prof. EDWIN LINCOLN, Bowling Green, Ohio.	1918
MOSES, Mrs. EDMUND QUINCEY, 303 W. 84th St., New York, N. Y.	1919
MOSEHER, FRANKLIN H., 17 Highland Ave., Melrose Highlands, Mass.	1905
MOULTON, HERBERT F., 36 W. Main St., Ware, Mass.	1920
MOUSLEY, Wm. HENRY, Hatley, Quebec, Canada.	1915
MULLEN, JAMES L., 1264 Logan Ave., Salt Lake City, Utah.	1919
MUNRO, J. A., Okanagan Landing, British Columbia.	1913
MUNRO, Mrs. WALTER S., 40 N. Main St., So. Norwalk, Conn.	1920
MURIE, O. J., 219 7th Ave., S., Moorhead, Minn.	1913
MURPHY, Dr. EUGENE EDMUND, 432 Telfair St., Augusta, Ga.	1919
MURPHY, EDW. A. C., 94 Prospect St., New Haven, Conn.	1920
MURPHY, Mrs. GRACE E. B., 73 Muddagh St., Brooklyn, N. Y.	1919
MURRAY, EDGAR H., 439 Guoin St., Detroit, Mich.	1919
MUSGRAVE, Mrs. MARK E., Box 765, Phoenix, Ariz.	1920
MYERS, Mrs. HARRIET W., 311 N. Ave. 66, Los Angeles, Calif.	1906
MYERS, Miss LUCY F., 127 Academy St., Poughkeepsie, N. Y.	1898
NAUMAN, E. D., Box 606, Sigourney, Iowa.	1918
*NEELY, JAMES C., 135 High St., Brookline, Mass.	1919
NEFF, JOHNSON, Marionville, Mo.	1919
NEWBERRY, W. F., 233 Broadway, New York, N. Y.	1920
NEWCOMB, C. A., Jr., Rt. 3, Pontiac, Mich.	1920
NICE, Mrs. MARGARET M., Norman, Okla.	1920
NICHOLS, L. NELSON, N. Y. Public Library, New York, N. Y.	1917
NICHOLS, RODMAN A., 33 Warren St., Salem, Mass.	1919
NICHOLSON, NEVIN G., 410 Elm St., Grove City, Pa.	1920
NILES, Mrs. C. F., Hopedale, Mass.	1920
NIMS, Mrs. LUCIUS, 17 Union St., Greenfield, Mass.	1913
NINNINGER, Prof. H. H., McPherson College, McPherson, Kan.	1920
NOBLE, ELEANOR G., 66 Sparks St., Cambridge, Mass.	1916
NOBLE, G. KINGSLEY, Am. Mus. Nat. Hist., New York, N. Y.	1916
NOKES, Dr. I. D., 1800 So. Van Ness Ave., Los Angeles, Calif.	1915
NOLTE, Rev. FELIX, St. Benedict's College, Atchison, Kan.	1903
NORRIS, EDWARD, 301 W. Springfield Ave., Philadelphia, Pa.	1916
NORRIS, J. PARKER, Jr., 2122 Pine St., Philadelphia, Pa.	1904
NORTON, Mrs. CARRIE MORSE, Faulkton, S. Dak.	1918
NOTT, Miss ETHEL A., 309 S. Pine St., Reedsburg, Wis.	1920

NUGENT, JAMES R., 772 Broad St., Newark, N. J.....	1920
OGDEN, DAVID B., 23 Alton Place, Brookline, Mass.....	1920
OGDEN, DR. HENRY VINING, 141 Wisconsin St., Milwaukee, Wis.....	1897
OLDYS, HENRY, Silver Springs, Md.....	1896
ONDESCO, Miss MARY E., Gardner, Ill.....	1920
O'ROARK, Mrs. L. S., R. 2, Mt. Kemble, Morristown, N. J.....	1919
OSBORN, Prof. HENRY F., Am. Mus. Nat. Hist., New York, N. Y....	1919
OSBORNE, ARTHUR A., 183 Lowell St., Peabody, Mass.....	1912
OSLER, H. S., 1 Rosedale Road, Toronto, Ont.....	1920
OTTEMILLER, FREE, 752 S. George St., York, Pa.....	1914
OVERTON, DR. FRANK, Patchogue, N. Y.....	1909
*OWEN, Miss JULIETTE AMELIA, 306 N. 9th St., St. Joseph, Mo....	1897
PACKARD, WINTHROP, 1442 Washington St., Canton, Mass.....	1917
PAINE, AUGUSTUS G., Jr., 31 E. 69th St., New York, N. Y.....	1886
PAINE, CHARLES JACKSON, 705 Sears Bldg., Boston, Mass.....	1917
PAINTER, KENYON V., 3240 Fairmount Blvd., Cleveland, Ohio.....	1920
*PALMER, Miss E. D., 1741 S. Harvard Blv'd., Los Angeles, Calif....	1918
PALMER, R. H., Dept. Geol., Univ. Washington, Seattle, Wash.....	1917
PALMER, Dr. SAMUEL C., 712 Ogden Ave., Swarthmore, Pa.....	1899
PALMER, Mrs. T. S., 1939 Biltmore St., N. W., Washington, D. C....	1918
PANGBURN, CLIFFORD H., 2797 Morris Ave., New York, N. Y.....	1907
PARKER, ARTHUR JOHN, So. Lincoln, Mass.....	1920
*PARKER, EDWARD LUDLOW, Nashawtuc Rd., Concord, Mass.....	1916
PARKER, HERBERT, So. Lancaster, Mass.....	1920
PATTEN, Dr. STEPHEN K., 141 Milk St., Boston, Mass.....	1920
PAUL, LUCIUS H., 436 Carter St., Rochester, N. Y.....	1908
PAXTON, Mrs. REGINA A., 59 Walmer Road, Toronto, Ontario.....	1917
PEABODY, Rev. P. B., Blue Rapids, Kan.....	1903
PELLEW, Miss M. J., 1637 Mass. Ave., N. W., Washington, D. C....	1919
PEMBERTON, JOHN ROY, Box 1112, Tulsa, Okla.....	1918
PENNELL, Miss ELIZABETH A. S., 252 Maine St., Brunswick, Me....	1918
PENNINGTON, WM. DANA, 1722 4th St., Washington, D. C.....	1919
*PENROSE, Dr. CHAS. BINGHAM, 1720 Spruce St., Philadelphia, Pa....	1919
PEPPER, Dr. WM., 1813 Spruce St., Philadelphia, Pa.....	1911
PERINE, KEBLE, 26 Trull St., Dorchester, Mass.....	1917
PERKINS, Dr. ANNE E., Gowanda Hospital, Collins, N. Y.....	1917
PERKINS, ARTHUR W., 21 High St., Farmington, Me.....	1915
PERKINS, EDW. H., Box 52, Waterville, Me.....	1920
PERKINS, Dr. GEORGE H., Univ. of Vt., Burlington, Vt.....	1912
PERRY, Dr. HENRY JOSEPH, 45 Bay State Road, Boston, Mass.....	1909
PETERS, ALBERT S., Lake Wilson, Minn.....	1908
PETERSON, ALFRED, Pipestone, Minn.....	1920
PETTY, ORVILLE A., Chapel St. & Sherman Ave., New Haven, Conn.	1919
PHELPS, FRANK M., 212 E. 4th St., Elyria, Ohio.....	1912
PHELPS, Mrs. J. W., Box 36, Northfield, Mass.....	1899

PHELPS, WARREN A., 19 Tennyson Ave., Pittsfield, Mass.....	1920
PHILIPP, PHILIP B., 220 Broadway, New York, N. Y.....	1907
PHILLIPS, ALEXANDER H., 54 Hodge Road, Princeton, N. J.....	1891
PHILLIPS, CHAS. LINCOLN, 5 West Weir St., Taunton, Mass.....	1912
PHILLIPS, CHAS. P., Univ. Minn., Minneapolis, Minn.....	1919
*PHILLIPS, JOHN M., 2227 Jane St., Pittsburgh, Pa.....	1920
PIERCE, WRIGHT McEWEN, Box 343, Claremont, Calif.....	1918
PILSBURY, FRANK O., 1088 Main St., Walpole, Mass.....	1917
PINCHOT, GIFFORD, Real Estate Trust Bldg., Philadelphia, Pa.....	1910
PINKUS, ALBERT S., 10 Fairfield Ave., Hartford, Conn.....	1919
PIRNIE, MILES D., McGraw Hall, Ithaca, N. Y.....	1919
PLATT, HON. EDMUND, 2339 Ashmead Place, Washington, D. C.....	1917
POE, MISS MARGARETTA, 1204 N. Charles St., Baltimore, Md.....	1899
POMEROY, F. E., Bates College, Lewiston, Me.....	1920
POOLE, EARL L., School Admin. Bldg., Reading, Pa.....	1916
POPE, ALEXANDER, 1013 Beacon St., Brookline, Mass.....	1919
POPE, E. F., Box 113, El Reno, Okla.....	1920
PORTER, LOUIS H., Stamford, Conn.....	1893
POST, WILLIAM S., Bernardsville, N. J.....	1911
POTTER, JULIAN K., 563 Bailey St., Camden, N. J.....	1912
POTTER, LAWRENCE B., Eastend, Sask.....	1919
POWERS, Miss EVA L., Greenwich Village, R. D., Mass.....	1920
PRAEGER, WILLIAM E., 421 Douglas Ave., Kalamazoo, Mich.....	1892
PRATT, HON. GEO. D., Telephone Bldg., Albany, N. Y.....	1917
PRICE, JOHN HENRY, Crown W Ranch, Knowlton, Mont.....	1906
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PRITCHARD, Mrs. F. A., 203 N. Court St., Medina, Ohio.....	1918
PROCTOR, GEORGE N., 35 Congress St., Boston, Mass.....	1919
PURDY, JAMES B., R. F. D. 1, Plymouth, Mich.....	1893
QUARLES, EMMET AUGUSTUS, 139 E 7th St., Plainfield, N. J.....	1918
QUILLIN, ROY W., 1025 Summit Ave., San Antonio, Tex.....	1920
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REAGH, Dr. ARTHUR LINCOLN, 39 Maple St., West Roxbury, Mass.....	1896
REED, Mrs. BESSIE, 1609 Vermont St., Lawrence, Kan.....	1920
REED, Miss CLARA EVERETT, Brookfield, Mass.....	1919
REESE, Mrs. ROBT. M., 3016 Dumbarton Ave., N. W., Wash'ton, D. C.....	1920
REGAR, H. SEVERN, 1400 De Kalb St., Norristown, Pa.....	1916
REHN, JAMES A. G., 6033 B Catherine St., Philadelphia, Pa.....	1901
REICHENBERGER, Mrs. VICTOR M., Hotel Essex, New York, N. Y.....	1916
REID, Mrs. BRUCE, Gulf Refinery, Port Arthur, Tex.....	1918

REID, RUSSELL, 722 5th St., Bismarck, N. Dak.....	1919
RETT, EGMONT Z., 3060 Larimer St., Denver, Colo.....	1917
RHOADS, CHARLES J., 1914 S. Rittenhouse Sq., Philadelphia, Pa.....	1895
RICE, HARRY L., 10 High St., Boston, Mass.....	1920
RICE, Miss HELEN M., Holton Arms School, 2125 S. St., N. W., Washington, D. C.....	1920
RICE, JAMES HENRY, JR., Brick House Plantation, Wiggins, S. C....	1910
RICE, WARD J., Roachdale, Ind.....	1913
RICHARDS, Miss HARRIET E., 36 Longwood Ave., Brookline, Mass...	1900
RICHARDSON, JENNESS, Zool. Mus. Univ. Minn., Minneapolis, Minn.	1920
RICHARDSON, W. D., 4215 Prairie Ave., Chicago, Ill.....	1917
RIDGWAY, JOHN L., Chula Vista, San Diego Co., Calif.....	1890
RIES, DONALD T., 401 Thurston Ave., Ithaca, N. Y.....	1920
RIIS, PAUL P., 301 Shaw St., Rockford, Ill.....	1920
RIKER, CLARENCE B., 43 Scotland Road, South Orange, N. J.....	1885
ROBBINS, CHARLES A., Onset, Mass.....	1914
ROBERTS, PREWITT, Conway, Mo.....	1919
ROBERTS, WILLIAM ELY, 207 McKinley Ave., Lansdowne, Pa.....	1902
ROBERTSON, HOWARD, 157 S. Wilton Drive, Los Angeles, Calif.....	1911
ROBERTSON, JOHN MCB., Box 121, Buena Park, Orange Co., Calif..	1920
ROBINSON, ANTHONY W., Haverford, Pa.....	1903
ROBINSON, Mrs. L. K., 1130 S. Franklin St., Denver, Colo.....	1919
ROBINSON, Miss MARY L., Lathrop Trade School, Kansas City, Mo.	1919
*ROGERS, CHAS. H., Nassau Inn, Princeton, N. J.....	1904
ROLAND, CONRAD K., 1208 DeKalb St., Norristown, Pa.....	1917
ROOSEVELT, FRANKLIN DELANO, Hyde Park, N. Y.....	1896
ROSE, GEORGE C., Ellenville, N. Y.....	1920
ROSS, GEO. H., 23 West St., Rutland, Vt.....	1904
ROSS, Dr. LUCRETIOUS H., 507 Main St., Bennington, Vt.....	1912
ROUSH, GEO. HAROLD, 48 Stewart St., Morgantown, W. Va.....	1919
ROWAN, Prof. WILLIAM, Univ. of Alberta, Edmonton, Alta.....	1920
RUGG, HAROLD GODDARD, Dartmouth College, Hanover, N. H.....	1919
RUST, HENRY J., Coeur d'Alene, Idaho.....	1918
RYDER, Mrs. ROBERT O., 1041 Franklin Ave., Columbus, Ohio.....	1919
SACKETT, CLARENCE, Rye, N. Y.....	1910
SAGE, HENRY M., Menands Road, Albany, N. Y.....	1885
SAGE, Mrs. MARY SEARL, 1974 Broadway, New York, N. Y.....	1919
SALYER, J. CLARK, 2412 Main St., Lexington, Mo.....	1919
SAMPSON, Dr. JOHN A., 180 Washington Ave., Albany, N. Y.....	1920
SANBORN, COLIN C., P. O. Box 55, Chicago, Ill.....	1911
SANDERSON, Miss EVA E., 729 Dedham St., Newton Center, Mass...	1920
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SANTENS, REMI H., Carnegie Mus., Pittsburgh, Pa.....	1918
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SAVAGE, JAMES, 1097 Ellicott Sq., Buffalo, N. Y.....	1895

SAVAGE, MAHLON L., 1338 Orthodox St., Frankford, Philadelphia, Pa.	1919
SAWYER, C. J., 22 Lincoln St., Hudson, Mass.	1920
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SCHAFER, J. J., Port Byron, Ill.	1918
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SCHONNEGEL, JULIAN ELIOT, 92 Morningside Ave., New York, N. Y.	1918
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SCHRENCK, DR. HERMANN VON, 4139 McPherson Ave., St. Louis, Mo.	1919
SCHRODER, HUGO H., 303 E. State St., Bettendorf, Iowa.	1920
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SCUDDER, DR. WALTER H., Litchfield, Medina Co., Ohio.	1920
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SHELDON, H. H., Commercial Tr. Bank, Santa Barbara, Calif.	1919
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SHIRLEY, LESTER L., 144 Buntin St., Vincennes, Ind.	1917
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SPENCER, Miss C. S., Dept. of Zoöl., Coe College, Cedar Rapids, Ia.....	1917
SPEERY, CHARLES C., Biological Survey, Washington, D. C.....	1920
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TUDBURY, WARREN C., 1939 Marin Ave., Berkeley, Calif.	1903
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TWITCHELL, A. H., Flat, Alaska.	1918
TYLER, JOHN G., Box 173, Fresno, Calif.	1912
UFFORD, DR. EUGENE V., 231 Central St., Auburndale, Mass.	1918
UNDERWOOD, WM. LYMAN, Mass Inst. of Tech., Cambridge, Mass.	1900
URNER, CHARLES A., 613 Cleveland Ave., Elizabeth, N. J.	1920
VALENTINE, MISS ANNA J., Bellefonte, Pa.	1905
VALLANDINGHAM, MISS KATIE, 811 Highland Ave., Carrollton, Ky.	1918
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VAN NAME, WILLARD G., Am. Mus. Nat. Hist., New York, N. Y....	1900
VAN NEMAN, MISS LOULA, Westport High School, Kansas City, Mo..	1919
VARICK, DR. WM. REMSEN, 875 Elm St., Manchester, N. H.....	1920
VETTER, DR. CHARLES, 67 West 12th St., New York, N. Y.....	1898
VIERECK, HENRY L., Biological Survey, Washington, D. C.....	1916
VORHIES, DR. CHAS T., Univ. of Ariz., Tucson, Ariz.....	1918
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WETMORE, MRS. EDMUND H., Babylon, N. Y.....	1902
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WILEY, MISS LENA CATHERINE, Buckland, Mass.....	1918
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MEETINGS OF THE American Ornithologists' Union

Since its organization in 1883 the American Ornithologists' Union has held one special and 39 annual meetings.

Meeting	Date	Place	Fellows Present	Total Membership
1	1883, Sept. 26-28	1st New York	21	93
2	1884, Sept. 30-Oct. 2	2d New York	16	143
3	1885, Nov. 17-18	3d New York	16	201
4	1886, Nov. 16-18	1st Washington	20	251
5	1887, Oct. 11-13	1st Boston	17	284
6	1888, Nov. 13-15	2d Washington	20	298
7	1889, Nov. 12-15	4th New York	20	400
8	1890, Nov. 18-20	3d Washington	20	465
9	1891, Nov. 17-19	5th New York	14	493
10	1892, Nov. 15-17	4th Washington	20	557
11	1893, Nov. 20-23	2d Cambridge	17	582
12	1894, Nov. 12-15	6th New York	15	616
13	1895, Nov. 11-14	5th Washington	19	667
14	1896, Nov. 9-12	3d Cambridge	14	673
15	1897, Nov. 8-11	7th New York	18	679
16	1898, Nov. 14-17	6th Washington	21	695
17	1899, Nov. 13-16	1st Philadelphia	16	744
18	1900, Nov. 12-15	4th Cambridge	19	748
19	1901, Nov. 11-14	8th New York	18	738
20	1902, Nov. 17-20	7th Washington	25	753
20a	1903, May 15-16	1st San Francisco	7	—
21	1903, Nov. 16-19	2d Philadelphia	19	775
22	1904, Nov. 28-Dec. 1	5th Cambridge	17	808
23	1905, Nov. 13-16	9th New York	17	860
24	1906, Nov. 12-15	8th Washington	24	750
25	1907, Dec. 9-12	3d Philadelphia	20	850
26	1908, Nov. 16-19	6th Cambridge	17	888
27	1909, Dec. 6-9	10th New York	19	866
28	1910, Nov. 14-17	9th Washington	23	897
29	1911, Nov. 13-16	4th Philadelphia	18	887
30	1912, Nov. 11-14	7th Cambridge	18	929
31	1913, Nov. 10-13	11th New York	28	992
32	1914, Apr. 6-9	10th Washington	27	1101
33	1915, May 17-20	2d San Francisco	11	1156
34	1916, Nov. 13-16	5th Philadelphia	26	830
35	1917, Nov. 12-15	5th Cambridge	21	891
36	1918, Nov. 11	12th New York	14	953
37	1919, Nov. 10-13	13th New York	28	1024
38	1920, Nov. 8-11	11th Washington	25	1142
39	1921, Nov. 7-10	6th Philadelphia	25	1352

The next regular meeting—the 40th Stated—will be held at Chicago, Ill., October, 1922.

